



REFERENCES

- กองวิจัยและพัฒนาสมุนไพร กรมวิทยาศาสตร์การแพทย์. 2533. *สมุนไพรพื้นบ้านฉบับรวม*. กรุงเทพมหานคร : Text and Journal Corporation.
- ชุมพิต โยชะพันธุ์, ธงชัย รัตนไชย, และโจน สัมพันธ์รักษ์. 2508. การศึกษาเรื่องปวกหาดยารักษาพยาธิิตี I วิธีทำปวกหาดให้บริสุทธิ์ และการวิเคราะห์หามาตรฐาน. *หนังสือพิมพ์เภสัชกรรมสมัยสาม* 8 : 43-53.
- _____ ปัญญาศรี เบญจตล, เกลียว บุนนาค, และโจน สัมพันธ์รักษ์. 2508. การศึกษาเรื่องปวกหาดยารักษาพยาธิิตี II การทดสอบกัมมันตภาพของยาปวกหาดส่วนที่ละลายและไม่ละลายในอีเธอร์ต่อพยาธิในเครื่องแก้ว *หนังสือพิมพ์เภสัชกรรมสมัยสาม* 8 : 54-59.
- Aida, M., Shinomiya, K., Hano, Y., and Nomura, T. 1993. Artonin J,K, and L, three new isoprenylated flavones from the root bark of *Artocarpus heterophyllus* Lamk. *Heterocycles* 36 : 575-583.
- Altman, L.T., and Zito, S.W. 1976. Sterols and triterpenes from the fruit of *Artocarpus altilis*.. *Phytochemistry* 15 : 829-830.
- Aplin, R.T., Arthur, H.R., and Hui, W.H. 1966. The structure of triterpene simiarenonol (a E:B-friedo-hop-5-ene) from the Hong Kong species of *Rhododendron simiarenum*.. *J. Chem. Soc. (C)* : 1251-1255.
- Arora, J.S, Sandhu, R.S., Kamboj, S.S., and Chopra, S.K. 1987. Occurrence and characterization of lympho-agglutinins in indian plants. *Vox Sang* 52:134-137. *Chemical Abstracts* 106 : Abstract No. 211018 g.
- Arthur, H.R., and Hui, W.H. 1965. The structure of simiarenonol from the Hong Kong species of *Rhododendron simiarum*. *Tetrahedron Lett.* 14 : 937-943.
- Atthasampunna, P. 1975. Microbiological data on the activity of takian wood and tetrahydroxystilbene. *Thai J. Pharm. Sci.* 1 : 421-425.
- Barik, B.R., Bhaumik, T., Dey, A.K., and Kundu, A.B. 1994. Triterpenoids from *Artocarpus heterophyllus*. *Phytochemistry* 35 : 1001-1004.
- Budzikiewicz, H., Djerassi, C., and Williams, D.H. 1964. *Structure Eucidation of Natural Product by Mass Spectrometry* .Vol.II. : Steroids, Terpenoids, Sugar and Miscellaneous Classes. San Francisco : Holden-Day, Inc.

- _____, Wilson, J.M., and Djerassi, C. 1963. Mass spectrometry in structural and stereochemical problems XXXII pentacyclic triterpenes. *J. Am. Chem. Soc.* 85 : 3688-3699.
- Chakraborty, D.P., and Mandal, A.K. 1981. Aurantinamide acetate from *Artocarpus integrifolia* Linn. *J. Indian Chem. Soc.* 58 : 103. *Chemical Abstracts* 94 : Abstract No. 153452 q.
- Chakravarti, R.N., Mathato, S.B., and Banerjee, S.K. 1971. Triterpenes of the stem-bark of *Artocarpus chaplasha*. *Phytochemistry* 10 : 1351.
- Chakravarty, A.K. 1994. Unambiguous Assignment of ¹³C chemical shifts of some hopane and migrated hopane derivatives by 2D NMR. *Tetrahedron* 50(9) : 2865-2876.
- Chatterjee, B.P., Sarkar, N., and Rao, A.S. 1982. Serological and chemical investigations of the anomeric configuration of the sugar units in the D-galacto-D-mannan of fenugreek (*Trigonella foenum-graecum*) seed. *Carbohydr. Res.* 104 : 348-353 *Chemical Abstracts* 97 : Abstract No. 69258 k.
- Chauhan, J.S., and Kumari, G. 1979. A new glycoflavonol from the root bark of *Artocarpus lakoocha*. *Planta Med.* 37 : 86-88.
- _____, Kumari, G., Kumar, S., and Chaturvedi, R. 1982. Chemical examination of the root bark of *Artocarpus lakoocha*. *Proc. Natl. Acad. Sci. India Sect A* 52 : 217-218. *Chemical Abstracts* 93 : Abstract No. 102301 k.
- _____, Kumari, G., and Saraswat, M. 1979. A new flavonol glycoside from the root bark of *Artocarpus lakoocha*. *Indian J. Chem. Ser B* 18 : 473-475.
- Chen, C.C., Huang, Y.L., Ou, J.C., Lin, C.F., and Pan, T.M. 1993. 3 New prenylflavones from *Artocarpus altilis*. *J. Nat. Prod.* 56 : 1594-1597.
- Dassanayake, M.D. and Fosberg, F.R. 1981. *Flora of Ceylon*. Vol. III. New Delhi : Amerind Publish.
- Daulatabad, C.D., and Mirajkar, A.M. 1989. Ricinoleic acid in *Artocarpus integrifolia* seed oil. *J. Amer. Oil Chem. Soc.* 66 : 1631.
- Dayal, R., and Seshadri, T.R. 1974. Colorless components of roots of *Artocarpus heterophyllus* isolation of a new compound, artoflavone. *Indian J. Chem.* 12 : 895-896. *Chemical Abstracts* 82 : Abstract No.72735 j.
- Devon, T.K., and Scott, A.I. 1972. *Handbook of Naturally Occuring compounds*. Vol. II Terpene. New York : Academic Press.

- Duran, E., Ellington, E.V., Feng, P.C., Haynes, L.J., Magnus, K.E., and Philip, N. 1962. Simple hypotensive and hypertensive principles from some west indian medicinal plants. *J. Pharm. Pharmacol.* 14 : 562
- Ferreira De Miranda-Santos, I.K., Delgado, M., Bonini, P.V., Bunn-Mareno, M.M., and Campos-Neto, A. 1992. A crude extract of *Artocarpus integrifolia* contains two lectins with distinct biological activities. *Immunol. Lett.* 31 : 65-71. *Chemical Abstracts* 116 : Abstract No. 78788 w.
- Fujimoto, Y., Agusutein, S., and Made, S. 1987. Isolation of a chalcone derivative and antitumor compositions containing it. *Patent-Japan Kokai Tokkyo Koho-62 270 : 544. Chemical Abstracts* 110 : Abstract No. 13561 y.
- _____, Koshihara, Y., Made, S., and Agusutein, S. 1988. Isolation of 2-geranyl-3,4,2',4'-tetrahydroxychalcone as an anti-allergy agent. *Patent-Japan Kokai Tokkyo Koho-63 23 : 816. Chemical Abstracts* 109 : Abstract No. 134965 w.
- _____, Zhang, X.X., Kirisawa, M., Uzama, J., and Sumatra, M. 1990. New flavones from *Artocarpus communis* Forst. *Chem. Pharm. Bull.* 38 : 1787-1789.
- Fukai, T., and Nomura, T. 1993. ¹H-NMR spectra of prenylated flavonoids and pyranoflavonoids. *Heterocycles* 36 : 329-343.
- Goodwin, T.W., and Mercer, E.I. 1983. *Introduction to Plant Biochemistry* .2nd ed. Oxford : Pergamon Press.
- Hagiwara, K., Collet-Cassart, D., Kobayashi, K., and Vaerman, J.P. 1988. Jacalin : isolation, characterization, and influence of various factors on its interaction with human IGAI, as assessed by precipitation and latex agglutination. *Molec. Immunol.* 25 : 69-83.
- Hano, Y., Aida, M., and Nomura, T. 1990. Two new natural diels-alder type adduct from the root bark of *Artocarpus heterophyllus* . *J. Nat. Prod.* 53 : 391-395.
- _____, Aida, M., and Nomura, T. 1993. Artonin J, K, and L, three new isoprenylated flavones from the roots bark of *Artocarpus heterophyllus* Lamk. *Heterocycles* 36. : 575-583.
- _____, Aida, M., Nomura, T., and Ueda, S. 1992. A novel way of determining the structure of Artonin I, an optically active diels-alder type adduct, with the aid of an enzyme system of *Morus alba* cell culture. *Chem. Commun.* 17.: 1177-1178.

- _____, *et al.* 1989. Artonin A and B, two new prenylflavones from the root bark of *Artocarpus heterophyllus* Lamk. *Heterocycles* 29 : 1447-1453.
- _____, Inami, R., and Nomura, T. 1990. Components of the bark of *Artocarpus rigida* Bl. 1 structure of two new isoprenylated flavones, Artonin G and H. *Heterocycles* 31 : 2173-2179.
- _____, Inami, R., and Nomura, T. 1993. Constituents of the Moraceae plants. 18. Components of the bark of *Artocarpus rigida* Bl. 2 structure of 4 new isoprenylated flavone derivatives Artonin-M, Artonin-N, Artonin-O, and Artonin-P. *Heterocycles* 35 : 1341-1350.
- _____, Yamagami, Y., Kobayashi, M., Isohata, R., and Nomura, T. 1990. Artonin E and F, two new prenylflavones from the bark of *Artocarpus communis* Forst. *Heterocycles* 31 : 877-882.
- Hashim, O.H., Gendeh, G.S., and Jaafar, M.I.N. 1992. Lectin extracts of champedak seeds demonstrate selective stimulation of T lymphocyte proliferation. *Biochem. Int.* 27 : 139-143.
- Ikan, R. 1991. *Natural Products : A Laboratory Guide* 2 nd ed. London : Academic Press.
- Kapil, R.S., and Joshi, S.S. 1960. Chemical constituents of *Artocarpus lakoocha* . *J. Sci. Ind. Research* 19B : 498. *Chemical Abstract* 55 : Abstracts NO. 15536a.
- Koshihara, Y., Fujimoto, Y., and Inoue, H. 1988. A new 5-lipoxygenase selective inhibits arachidonic acid-induced ear edema. *Biochem. Pharmacol* 37 : 2161-2165.
- Kubo, I., and Ying, B.P. 1992. Phenolic constituents of California Buckeye fruit. *Phytochemistry* 31 : 3793-3794.
- Kuma, N.S., Pavanasivam, G., Sultanbawa, M.U.S., and Mageswaran, R. 1977. Chemical investigation of ceylonese plants. Part 24 new chromenoflavonoids from the bark of *Artocarpus nobilis* . (Moraceae). *J. Chem. Soc. Perkin Trans. I* : 1243-1251.
- Lin, C.N., and Lu, C.M. 1993. Heterophyllol, a phenolic compound with novel skeleton from *Artocarpus heterophyllus*.. *Tetrahedron letters* 34 : 8249-8250.
- _____, and Shieh, W.L. 1991. Prenylflavonoids and a pyranodihydrobenzoxanthone from *Artocarpus communis*. *Phytochemistry* 30 : 1669-1671.
- _____, and Shieh, W.L. 1992. Pyranoflavonoids from *Artocarpus communis*. *Phytochemistry* 31 : 2922-2924.

- _____, Shieh, W.L., and Jong, T.T. 1992. A pyranodihydrobenzoxanthone epoxide from *Artocarpus communis*. *Phytochemistry* 31 : 2563-2564.
- Lu, C.M., and Lin, C.N. 1993. 2,2',4',6'-Trioxygenated flavanones from *Artocarpus heterophyllus*. *Phytochemistry* 33 : 901-911.
- _____, and Lin, C.N. 1994. Flavonoids and 9-hydroxytridecyl docosanoate from *Artocarpus heterophyllus*. *Phytochemistry* 35 : 781-783.
- Luckner, M. 1990. *Secondary Metabolism in Microorganism, Plants and Animals..* New York : Springer-Verlag.
- Mahato, S.B., Banerjee, S.K., and Chakravarti, R.N. 1966. Triterpenes of *Artocarpus lakoocha..* *Bull. Calcutta Sch. Trop. Med.* 14 : 16. *Chemical Abstracts* 66 : Abstract No. 73220 u.
- Manitto, P. 1981. *Biosynthesis of Natural Products.* New York : Ellis Horwood.
- Markham, K.R. 1982. *Techniques of flavonoids identification..* London : Academic Press.
- Misra, T.N., Singh, R.S., Pandey, H.S. and Singh, S. 1992. Long-chain compounds from *Leucas aspera..* *Phytochemistry* 31 : 1809-1810.
- Mongolsuk, S., Robertson, A., and Towers, R. 1957. 2:4:3':5'-Tetrahydroxystilbene from *Artocarpus lakoocha*. *J. Chem. Soc.* : 2231-2233.
- Mu, Q.Z., and Li, Q.X. 1982. The isolation and identification of morin-calcium chelate compound from *Artocarpus pithecofallus* C.Y.W.U. and *Artocarpus heterophyllus* Lam. *Chih Wu Hsueh Pao* 24 : 147-153. *Chemical Abstracts* 97 : Abstract No. 107043 w.
- Namjuntra, P., and Chulavatnatol, M. 1984. Purification and characterization of a lectin from seeds of jack fruit (*Artocarpus heterophyllus*). *Abst. 10th conference of science and technology, Thailand, Chiangmai Univ. Chiangmai, Thailand* : 356-357
- Ogunkoya, L. 1981. Application of Mass Spectrometry in Structural Problems in Triterpenes. *Phytochemistry* 20 : 121-126.
- Ogura, M., Cordell, G.A., and Farnsworth, N.R. 1977. Potential anticancer agent IV constituents of *Jacaranda caucana* Pittier (Bignoniaceae) *J. Nat. Prod.* 40 : 157-168
- Ourisson, G., Crabbe, P., and Rodig, O.R. 1964. *Tetracyclic triterpenes* Paris : Hermann Publishers.
- Panasasivam, G., and Sultanbawa, M.U.S. 1973. Cycloartenyl acetate, cycloartenol and cycloartenone in the bark of *Artocarpus* species. *Phytochemistry* 12 : 2725-2726.

- _____, Sultanbawa, M.U.S., and Mageswaram, R. 1974. Chemical investigation of ceylonese plants X. new chromenoflavonoid from the bark of *Artocarpus nobilis* (Moraceae). *Chem. Ind. (London)* : 875.
- Pant, R., and Chaturvedi, K. 1989. 4-Hydroxyundecyl docosanate and cycloartenone in *Artocarpus integra* latex. *Phytochemistry* 28 : 2197-2199.
- Pathasarathy, P.C., Radhakrishnan, P.V., Rathi, S.S., and Venkataraman, K. 1969. Colouring matters of the wood of *Artocarpus heterophyllus* . *Indian J. Chem.* 7 : 101-102. *Chemical Abstracts* 71 : Abstract No. 70451 n.
- Pavaro, J., and Reutrakul, V. 1976. New flavone in *Artocarpus lakoocha* . *Mahidol Univ. J. Pharm. Sci.* 3 : 161-164.
- Pendse, A.D., Pendse, R., Rao, A.V.R., and Venkataraman, K. 1976. Integrin, cyclointegrin & oxyisocyclointegrin, three new flavone from the heartwood of *Artocarpus integer* . *Indian J. Chem. Ser. B* 14 : 69.
- Pereira, J.R., Medina, H., and Bustos, R.E. 1962. On the presence of acetylcholine in seeds of *Artocarpus integrifolia* (Moraceae) and of *Anona squamosa* (Anonaceae). *An. Fac. Med. Univ. Parana* 5 : 45-47. *Biological Abstracts* 46 : Abstract No. 12891.
- Perry, L.M. 1980. *Medicinal Plant of East and Southeast Asia* London : the MIT Press.
- Porter, J.W., and Spurgeon, S.E. 1981. *Biosynthesis of Isoprenoid Compound* . Vol I. New York : John Wiley and Sons.
- Rao, A.V.R., Rathi, S.S., and Venkataraman, K. 1972. Chaplashin, a flavone containing an oxepine ring from the heartwood of *Artocarpus chaplasha*.. *Indian J. Chem.* 10 : 905-907. *Chemical Abstracts* 78 : Abstract No. 82081 z.
- _____, Varadan, M., and Venkataraman, K. 1971. Coloring matters of the wood of *Artocarpus heterophyllus* Part VI cycloheterophyllin, a flavone linked to three isoprenoid groups. *Indian J. Chem.* 9 : 7
- _____, Varadan, M., and Venkataraman, K. 1973. Coloring matters of the wood of *Artocarpus heterophyllus* : Part VII - isocycloheterophyllin, a new flavone. *Indian J. Chem* 11 : 298-299. *Chemical Abstracts* 79 : Abstract No. 31957 c.

- Ratanachai, T. 1962. *Studies of Artocarpus lakoocha Roxb.* Master's Thesis, Chulalongkorn University.
- Richarts, J.H., and Hendrickson, J.B. 1964. *The Biosynthesis of Steroids, Terpenes, and Acetogenins.* New York : W.A. Benjamin, Inc.
- Robinsterin, I., Good, L.J., Clague, A.D.H., and Mulheim, L.J. 1976 The 220 MHz NMR spectra of phytosteroids. *Phytochemistry* 15 : 195.
- Sambhandharaksa, C., and Ratanachai, T. 1962. Pharmacognostical and phytochemical studies of *Artocarpus lakoocha* Roxb. *J. Natl. Res. Counc. Thailand* 3 : 245-255.
- Shieh, W.L., and Lin, C.N. 1992. A quinonoid pyranobenzoxanthone and pyranodihydrobenzoxanthone from *Artocarpus communis*. *Phytochemistry* 31 : 364-367.
- Sholichin, M., Yamasaki, K., Kasai, R., and Tanaka, O. 1980. ¹³C nuclear magnetic resonance of lupane-type triterpenes, lupeol, betulin and betulinic acid. *Chem. Pharm. Bull.* 28 : 1006-1008.
- Silverstein, R.M., Bassler, G.C., and Morrill, T.C. 1991. *Spectrometric identification of organic compounds* . 5th ed. New York : John Wiley & Sons.
- Smithinand, T. 1980. *Thai plant names* (Botanical names, vernacular names). 2nd ed. Bangkok : Funny Publishing.
- Sultanbawa, M.U.S., and Surendrakumar, S. 1989. Two pyranodihydrobenzoxanthones from *Artocarpus nobilis*. *Phytochemistry*. 28 : 599-605
- Suresh, G.K., Appukuttan, P.S., and Basu, D.K. 1982. Alpha-D-Galactose specific lectin from jack fruit (*Artocarpus integra*) seed. *J. Biol. Sci* 4 : 257-261
Medicinal Aromatic Plant Abstracts 83 : Abstract No. 83010447.
- Tulloch, A.P. 1977. The triterpenes of Ouricuri Wax., *Lipid* 12 : 233-234.
- Venkataraman, K. 1972. Review article wood phenolic in the chemotaxonomy of the Moraceae. *Phytochemistry* 11 : 1571-1586.
- _____, 1975. Artocarpus flavones. In Harborne, J.B., Mabry, T.J., and Mabry, H. (eds), *The Flavonoids* . pp. 280-283. London : Chapman and Hall.
- Vickery, M.L., and Vickery, B. 1981. *Secondary Plant Metabolism* London : The Macmillan Press.
- Wollenweber, E. 1982. Flavones and Flavonoids. In Haborns, J.B., and Mabry, T.J. (eds), *The Flavonoid; advance in research*. pp. 219-231. London : Chapman and Hall.

- Wright, J.L.C., Mc Innes, A.G., Shimizu, S., Smith, D.G., and Walter, J.A. 1978. Identification of C-24 alkyl epimers of marine sterols by ^{13}C nuclear magnetic resonance spectroscopy. *Can. J. Chem.* 56 : 1898-1903.
- Yamazaki, M., Okuyama, E., Matsudo, T., Takamaru, T., and Kaneko, T. 1987. Principles of Indonesian herbal drug having an antiulcerogenic activity. I isolation and identification of (+)-catechin from *Artocarpus integra* Merr. *Yakugaku Zasshi* 107 : 914-916. *Chemical Abstracts* . 108 : Abstract No. 68693 g.



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จุฬาลงกรณ์มหาวิทยาลัย



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



Figure 1 *Artocarpus gomezianus* Wall. ex Trec.
(กองวิจัยและพัฒนาสมุนไพร กรมวิทยาศาสตร์การแพทย์, 2533)

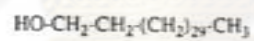
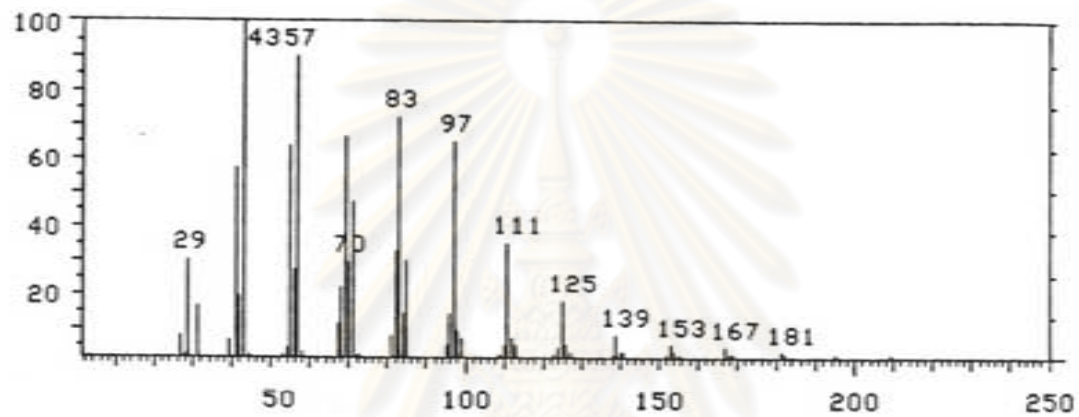


Figure 2 The EIMS spectrum of AG-1

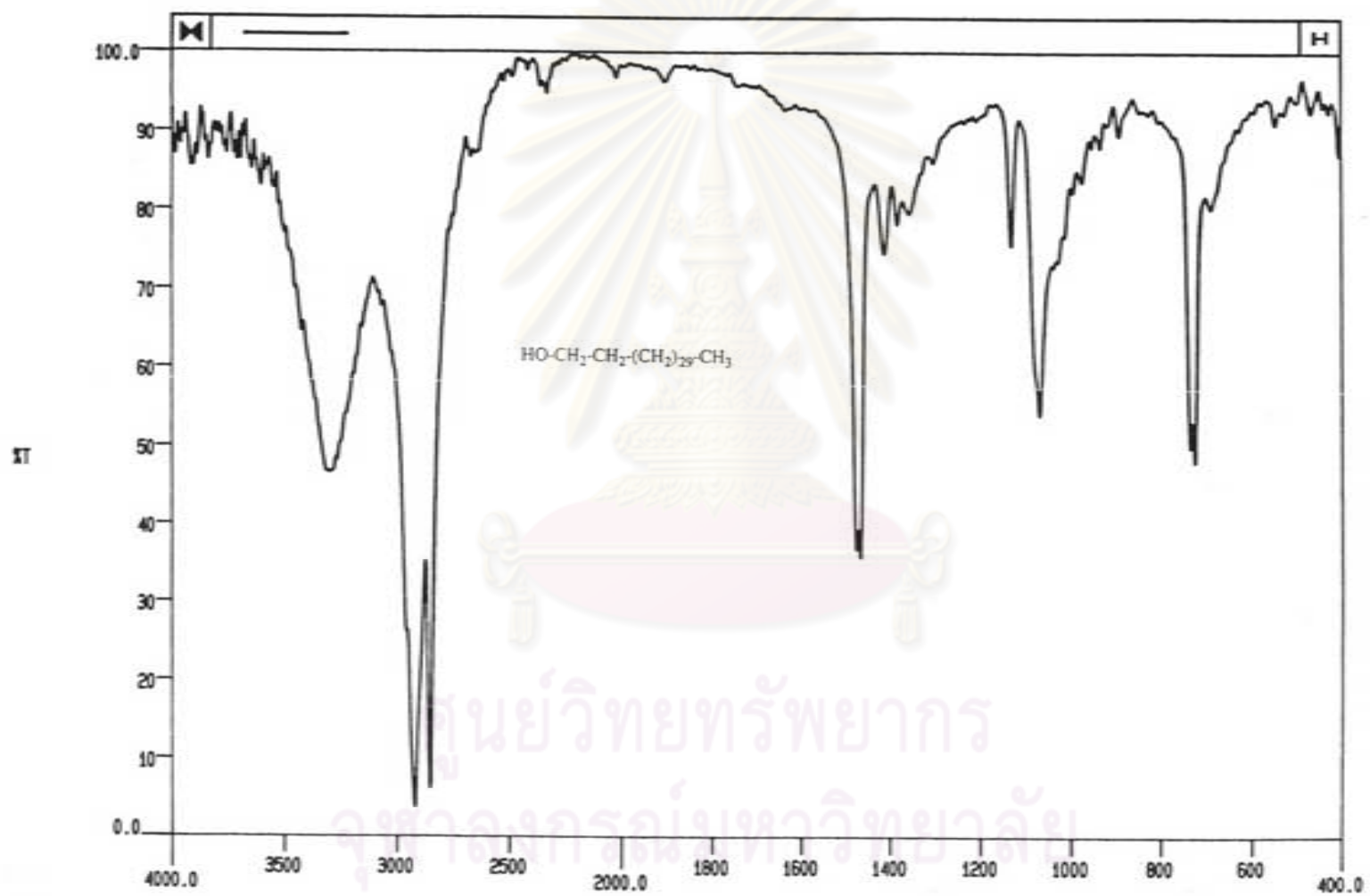


Figure 3 The IR spectrum of AG-1 (KBr disc)

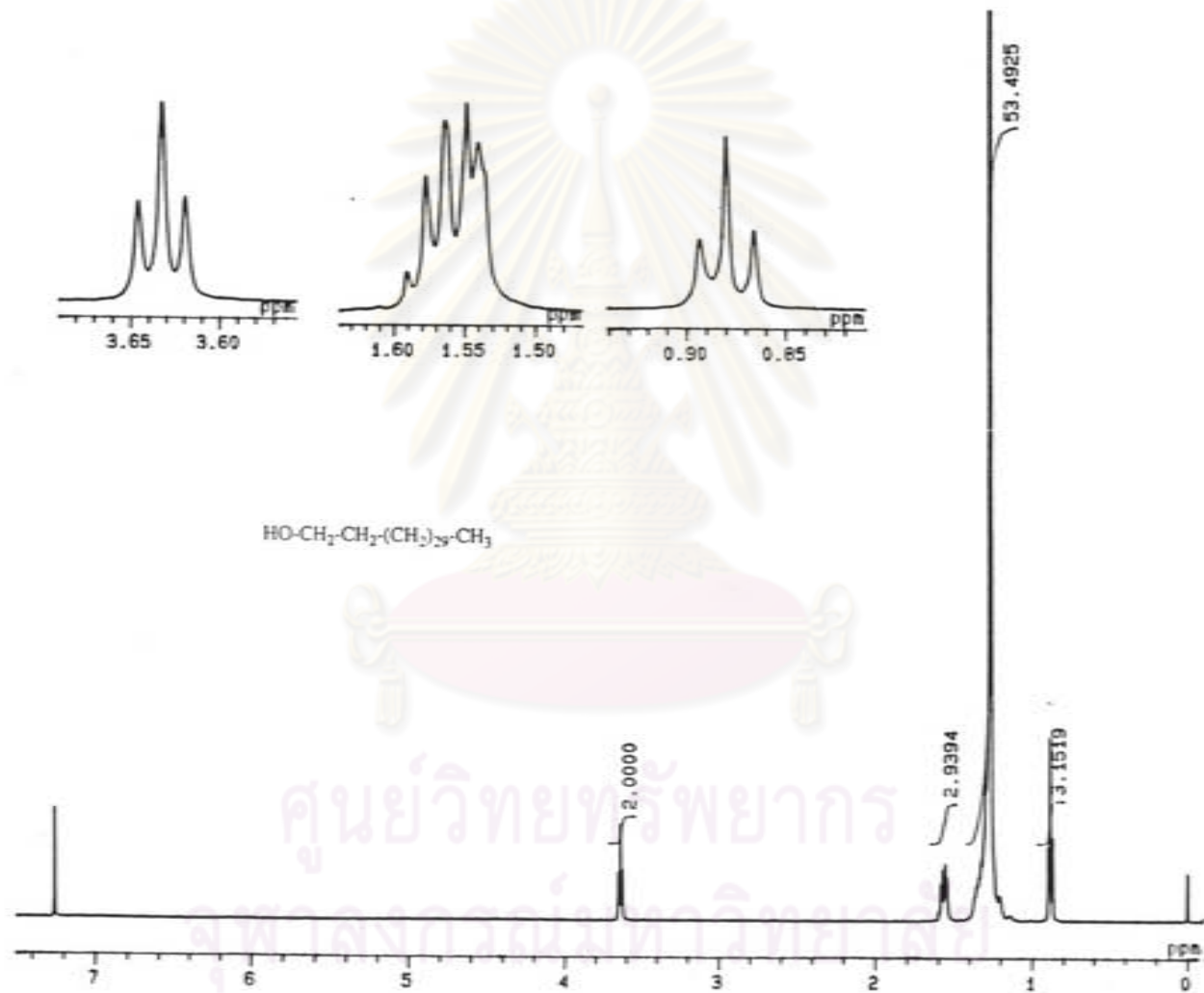


Figure 4 The 500 MHz ¹H NMR spectrum of AG-1 (in CDCl₃)

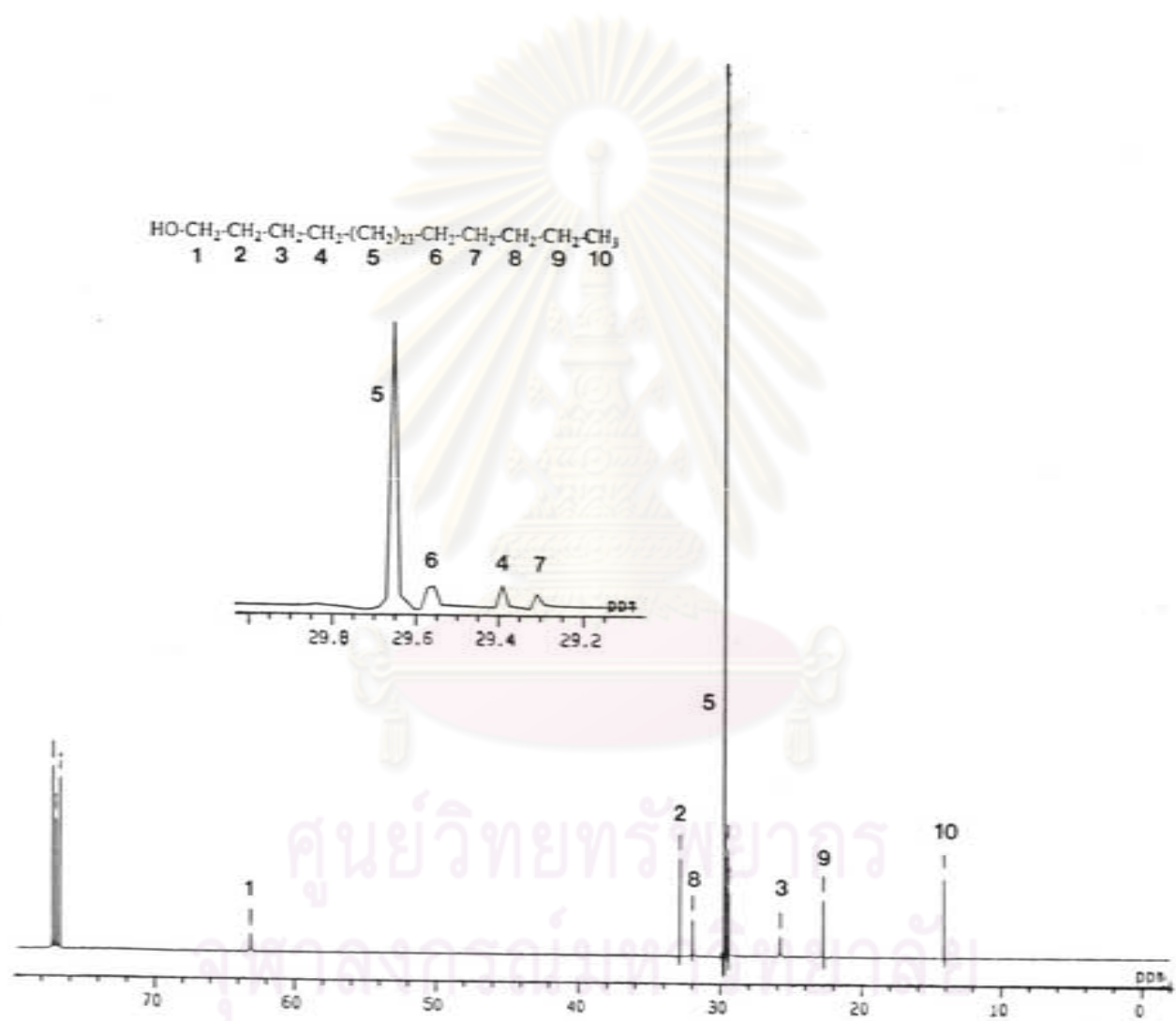


Figure 5 The 125 MHz ^{13}C NMR spectrum of AG-1 (in CDCl_3)



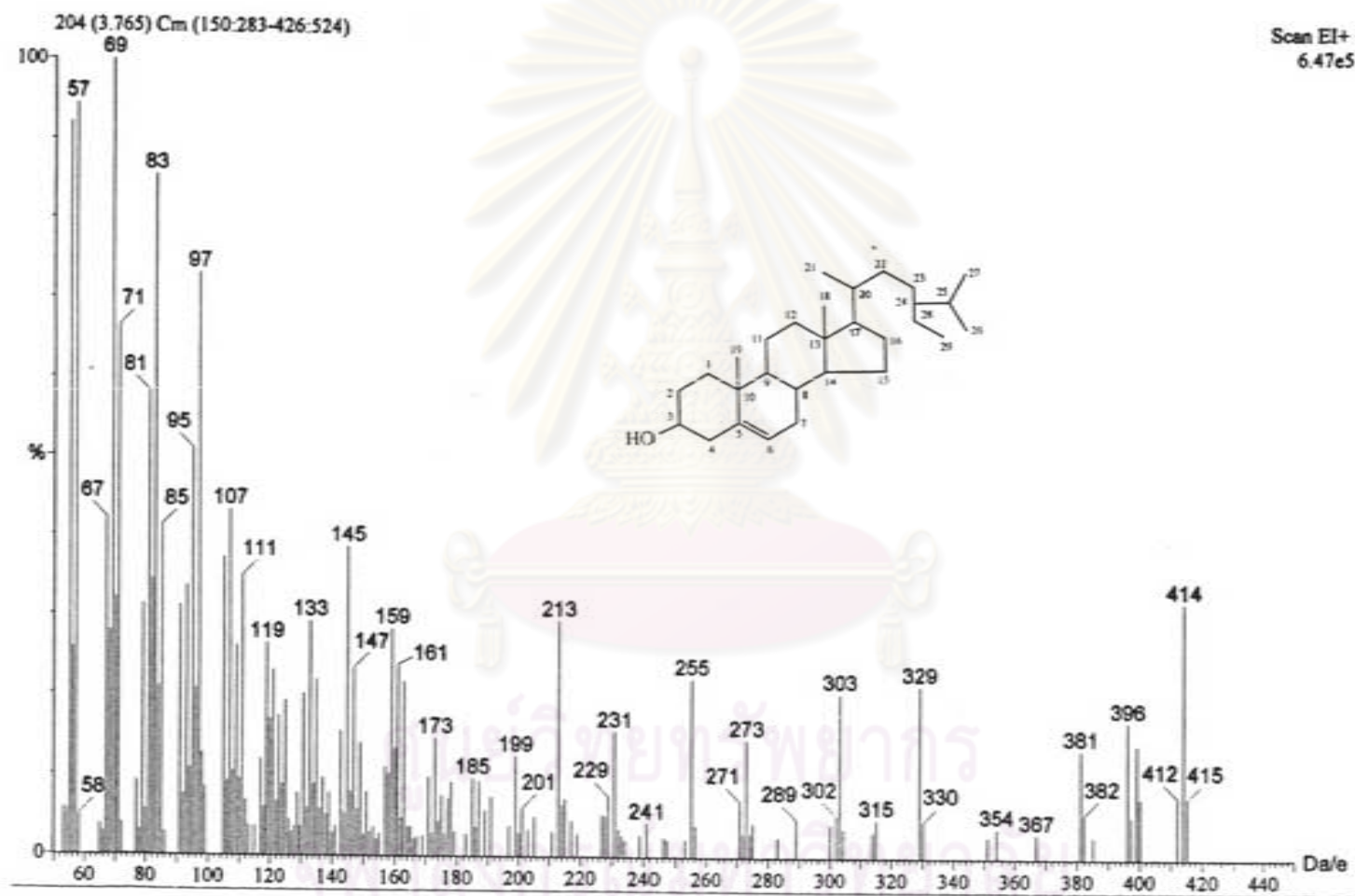


Figure 6 The EIMS spectrum of AG-2

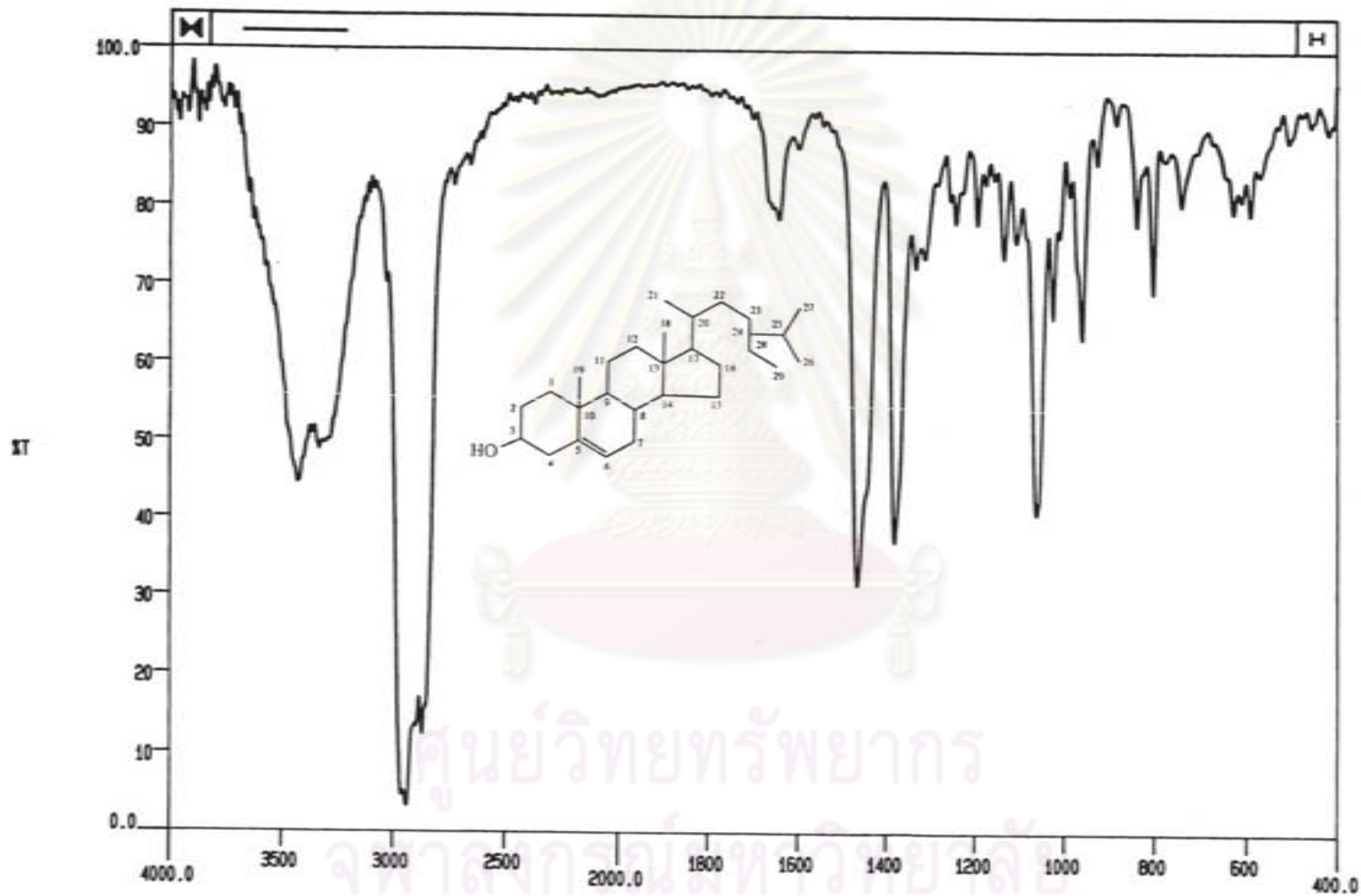


Figure 7 The IR spectrum of AG-2 (KBr disc)

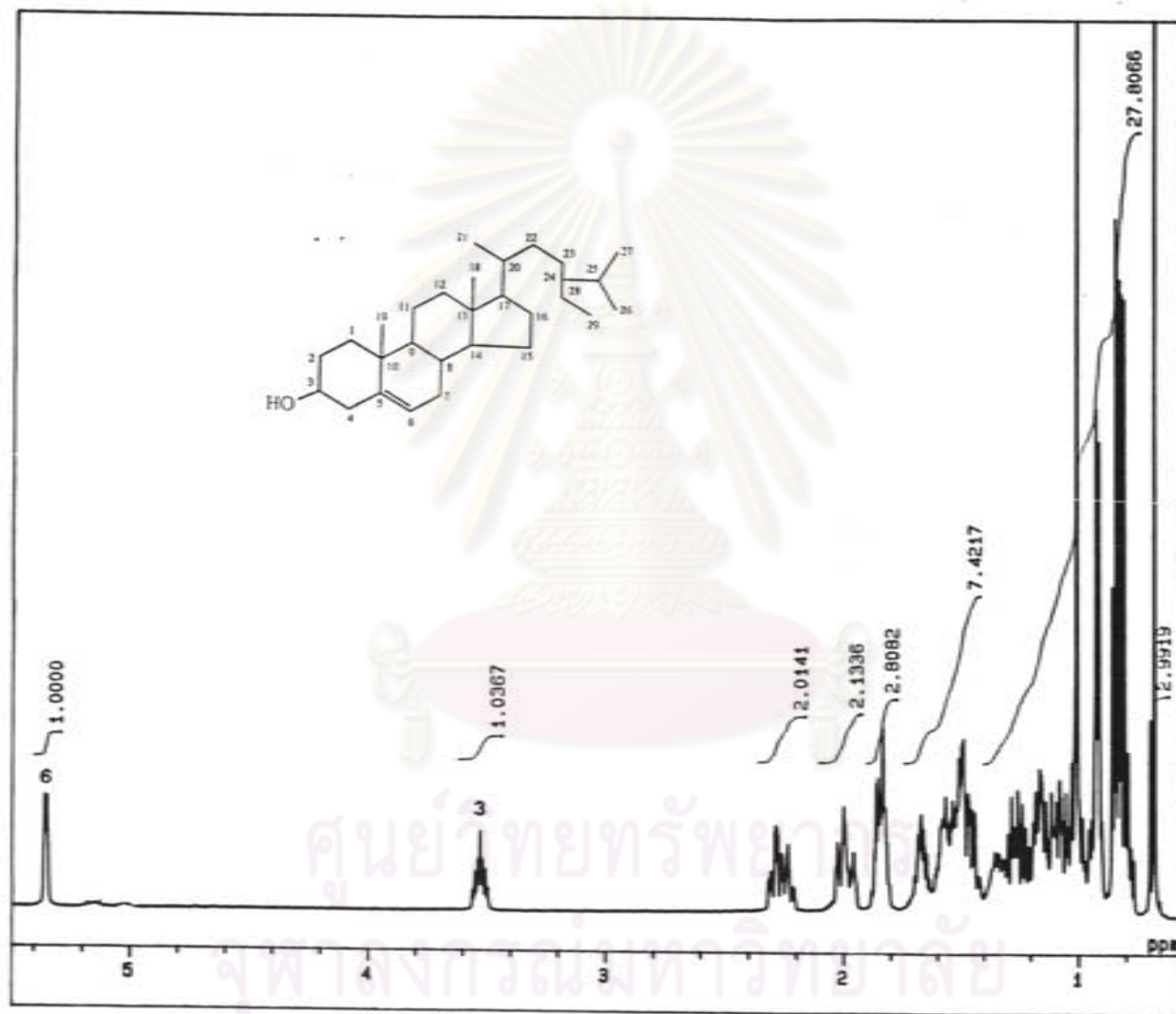


Figure 8 The 500 MHz ^1H NMR spectrum of AG-2 (in CDCl_3)

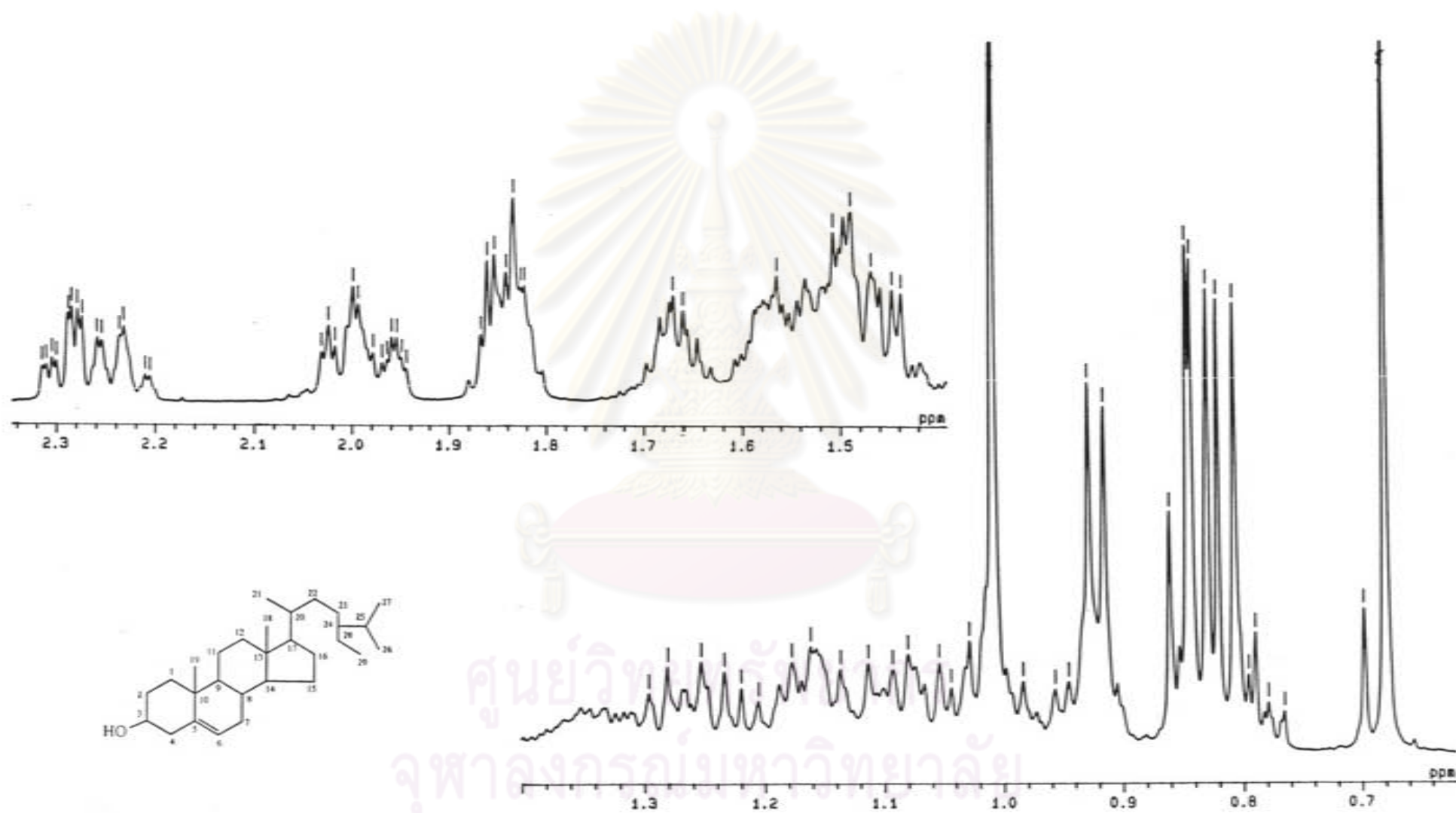


Figure 9 The expansion of 500 MHz ^1H NMR spectrum of AG-2 (in CDCl_3)

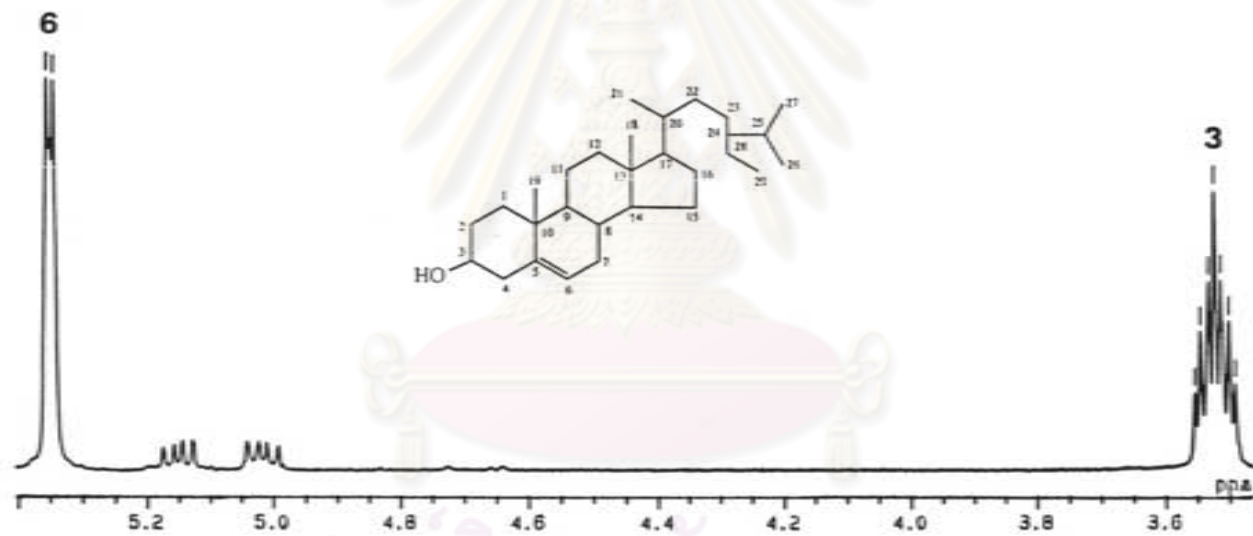


Figure 9 The expansion of 500 MHz ^1H NMR spectrum of AG-2 (in CDCl_3)

ศูนย์วิทยาศาสตร์สุขภาพ
จุฬาลงกรณ์มหาวิทยาลัย

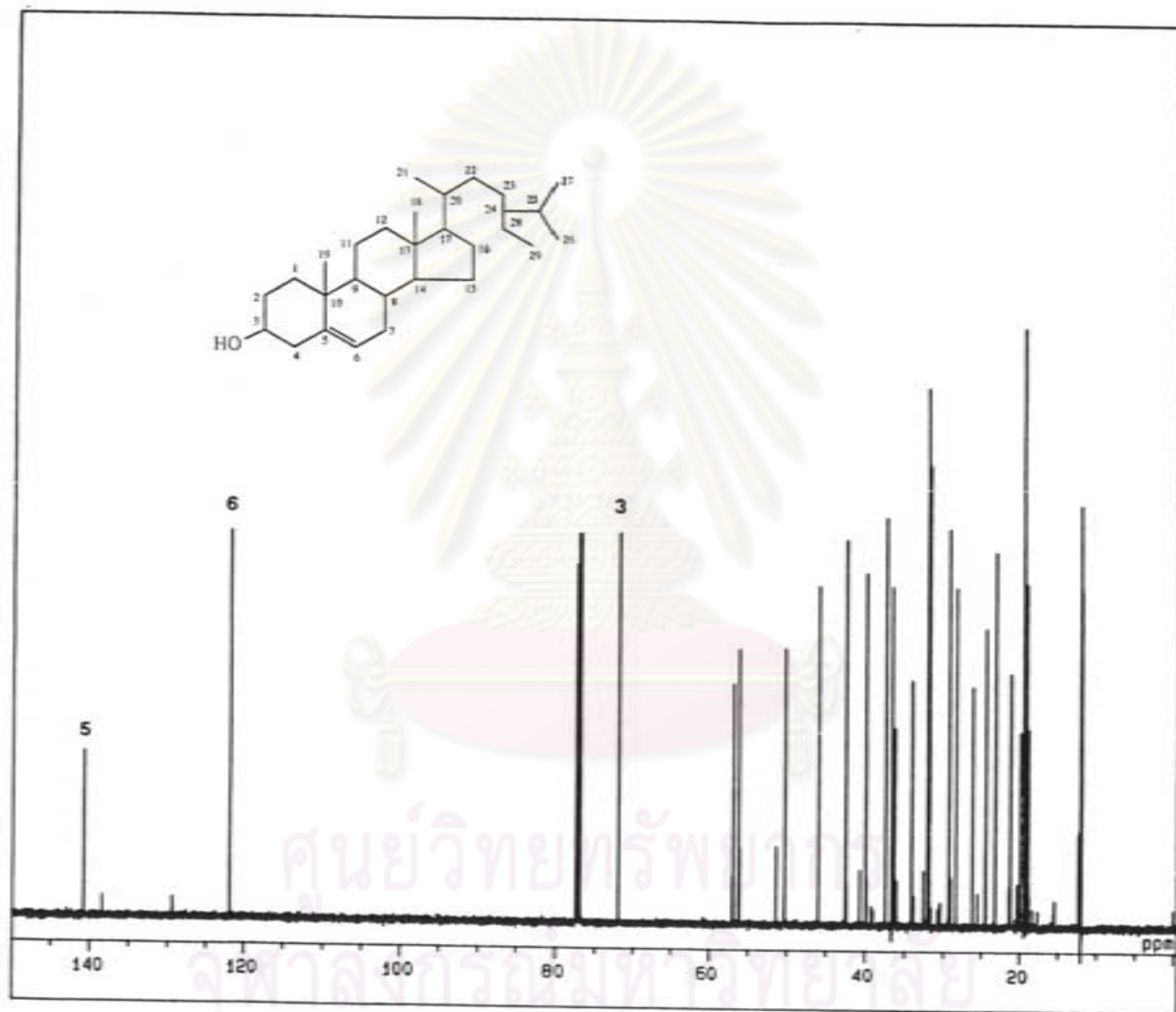


Figure 10 The 125 MHz ^{13}C NMR spectrum of AG-2 (in CDCl_3)

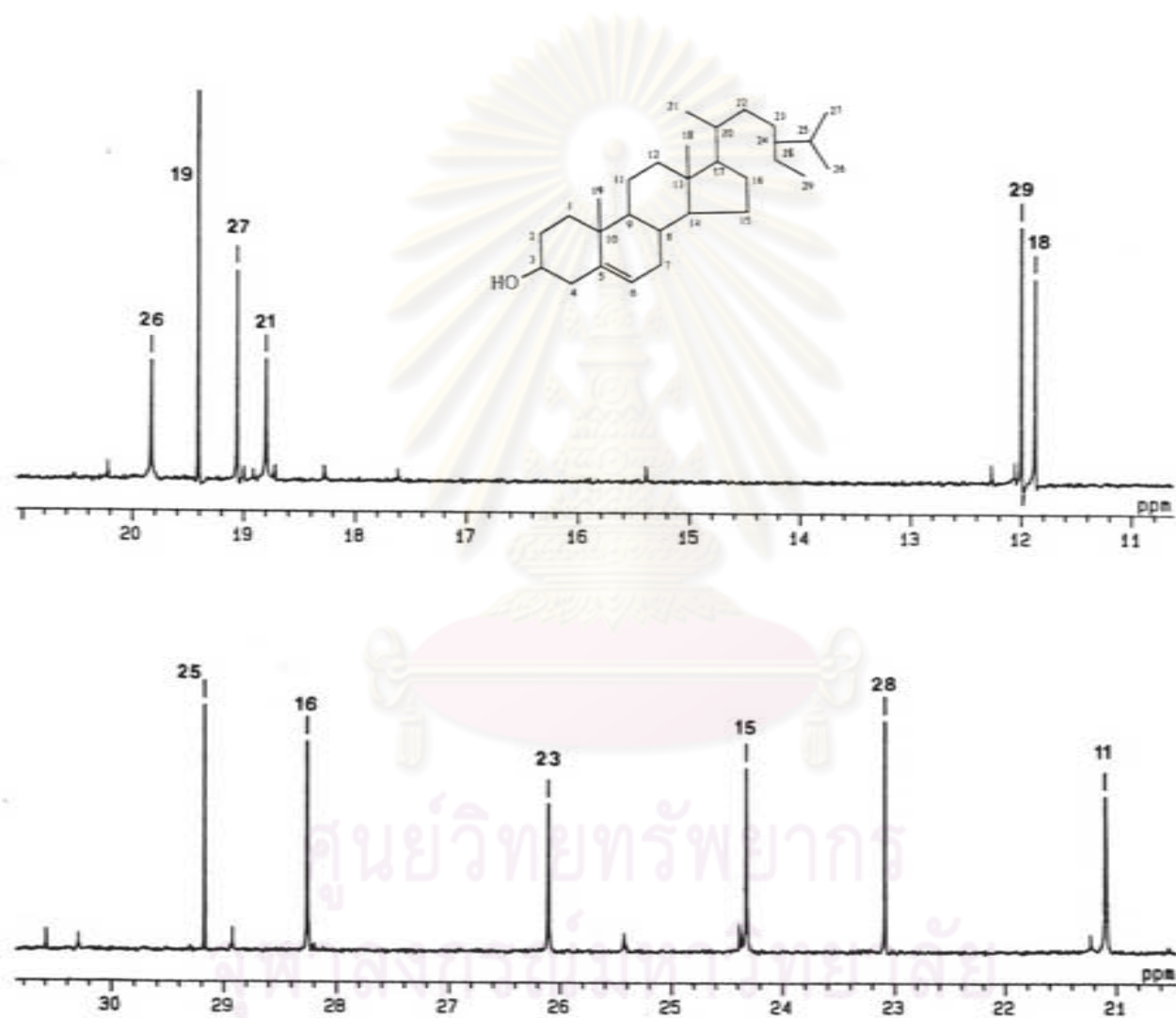


Figure 11 The expansion of 125 MHz ^{13}C NMR spectrum of AG-2 (in CDCl_3)

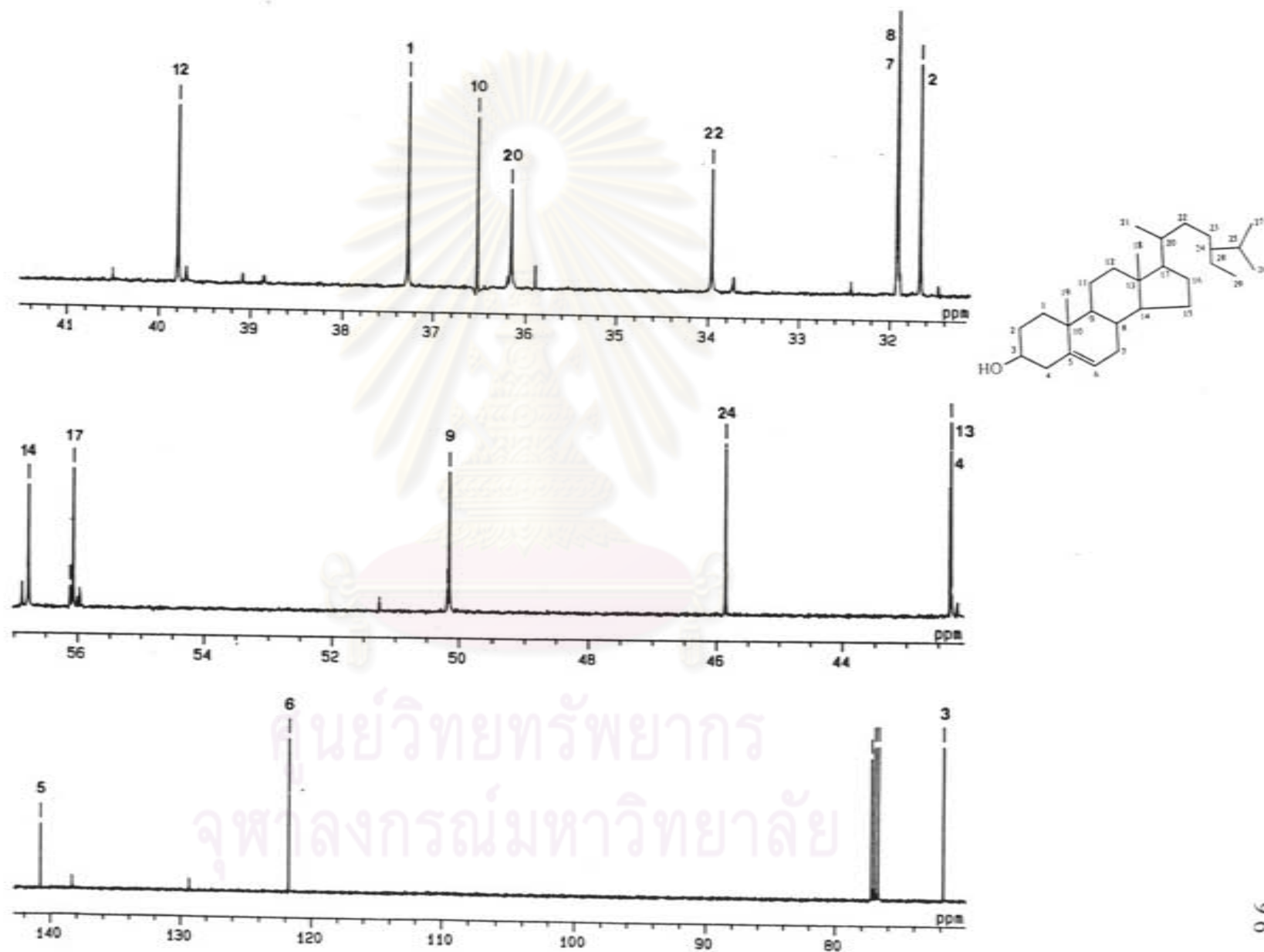


Figure 11 The expansion of 125 MHz ^{13}C NMR spectrum of AG-2 (in CDCl_3)

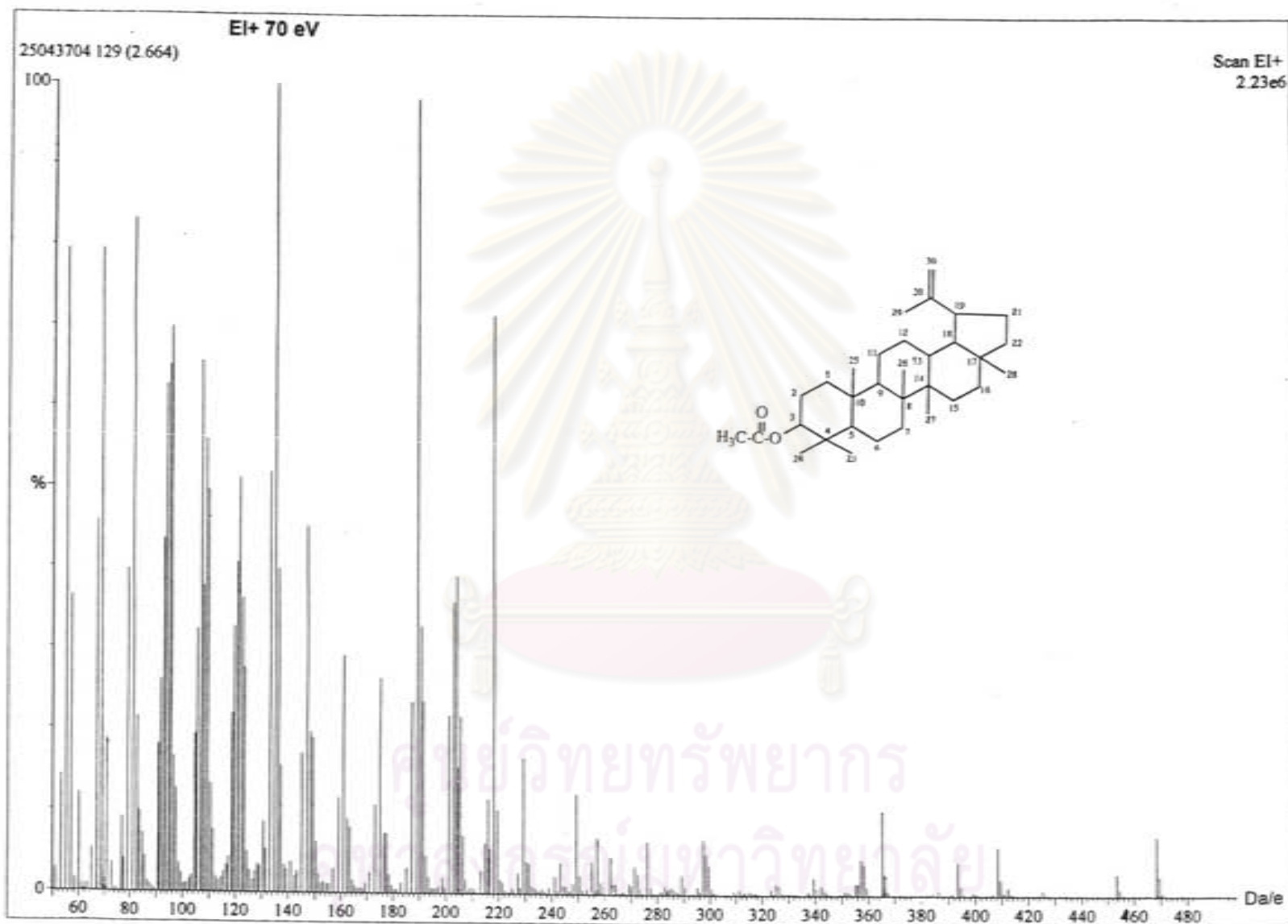


Figure 12 The EIMS spectrum of AG-3

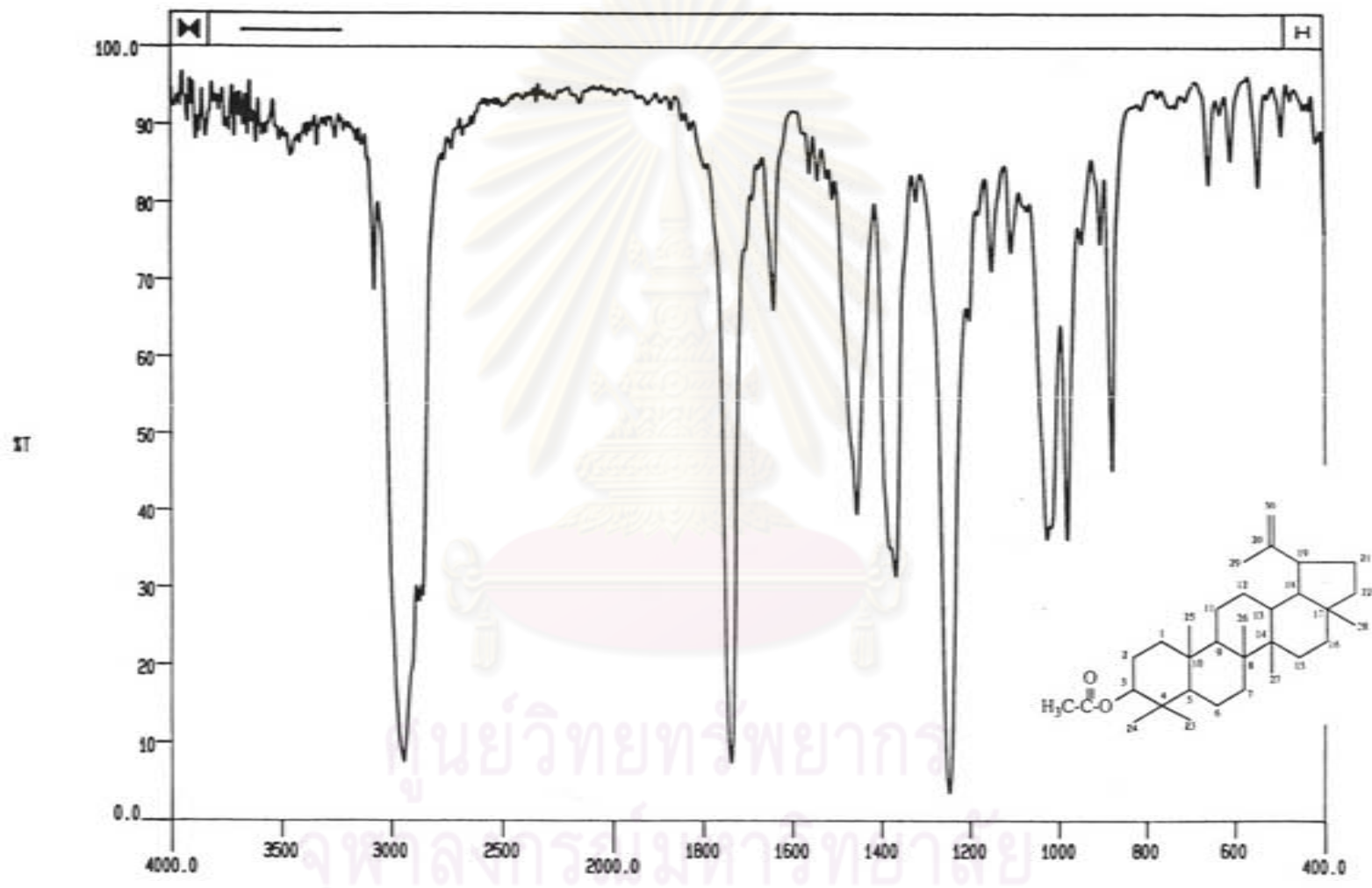


Figure 13 The IR spectrum of AG-3 (KBr disc)

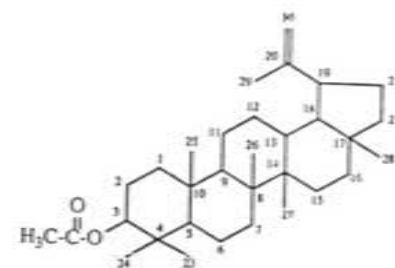
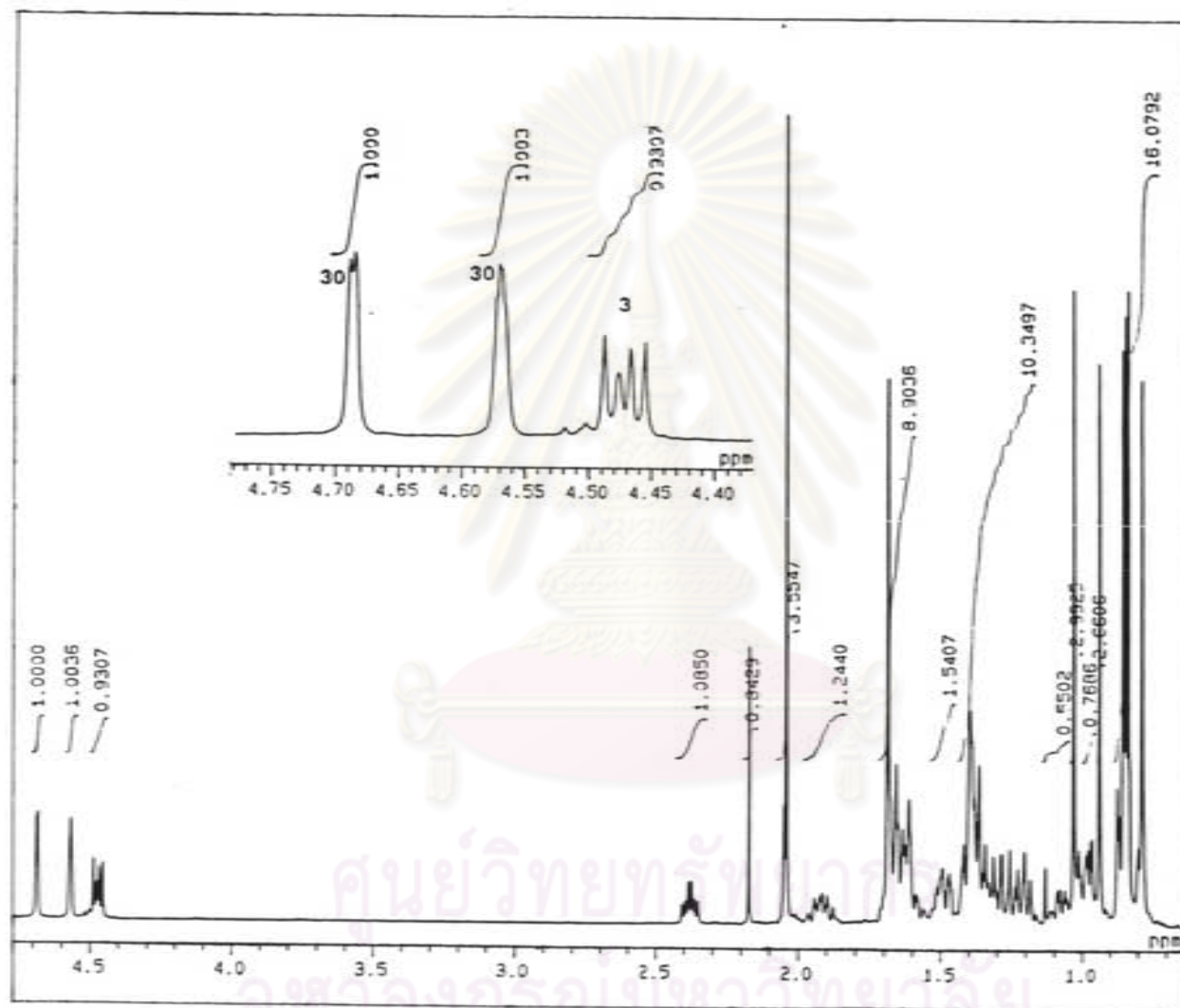


Figure 14 The 500 MHz ^1H NMR spectrum of AG-3 (in CDCl_3)

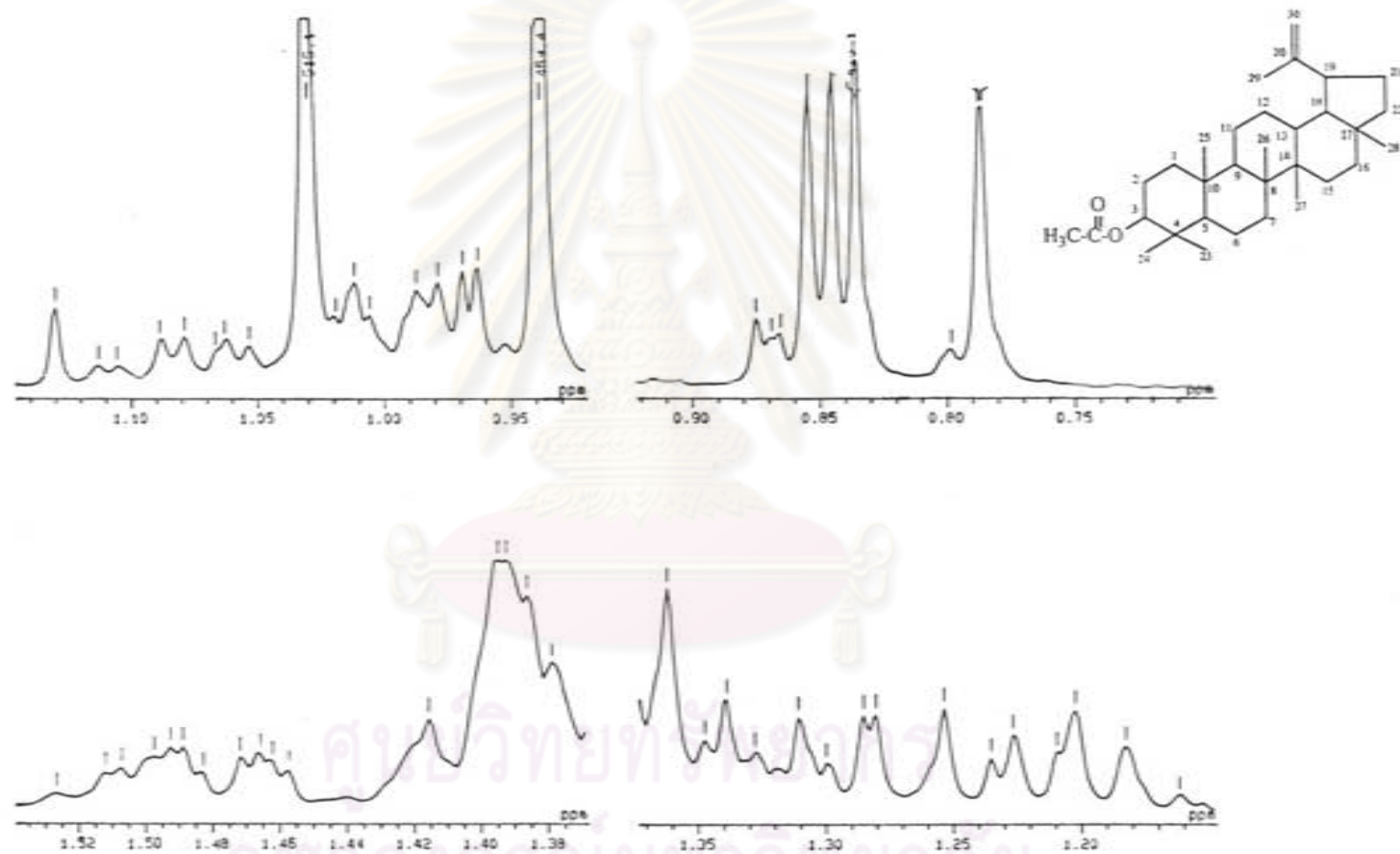


Figure 15 The expansion of 500 MHz ^1H NMR spectrum of AG-3 (in CDCl_3)

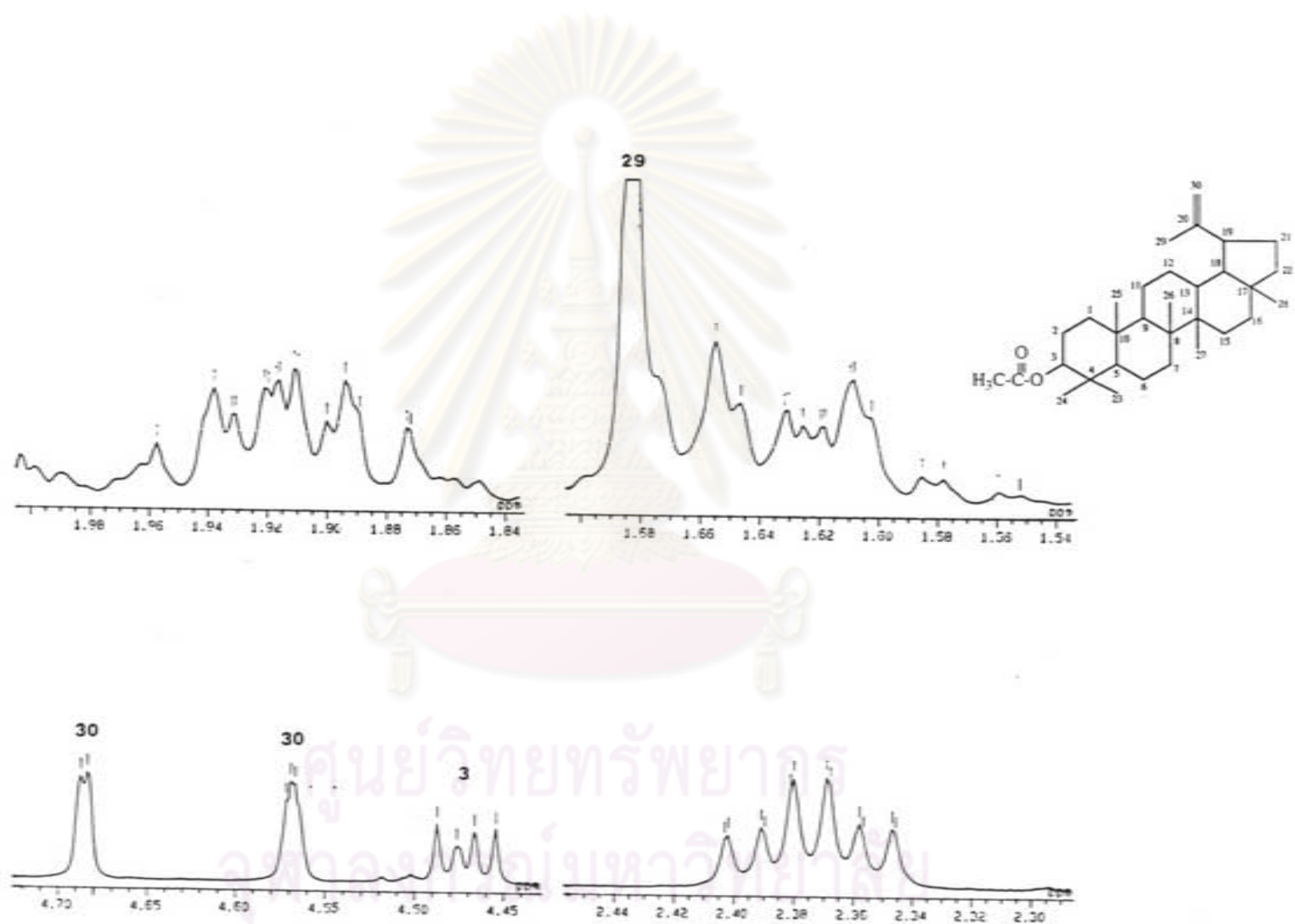


Figure 15 The expansion of 500 MHz ^1H NMR spectrum of AG-3 (in CDCl_3)

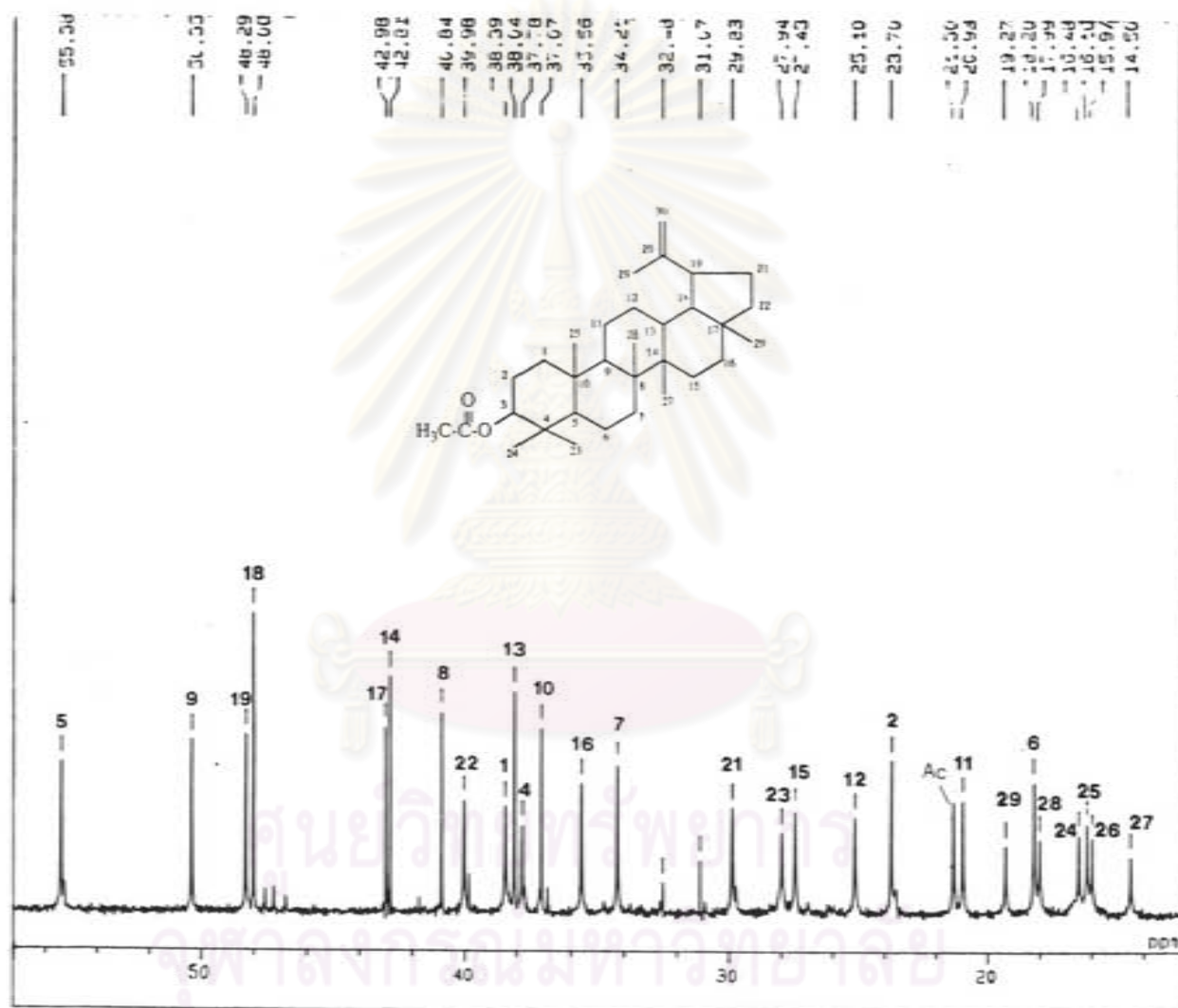


Figure 16 The 125 MHz ^{13}C NMR spectrum of AG-3 (in CDCl_3)



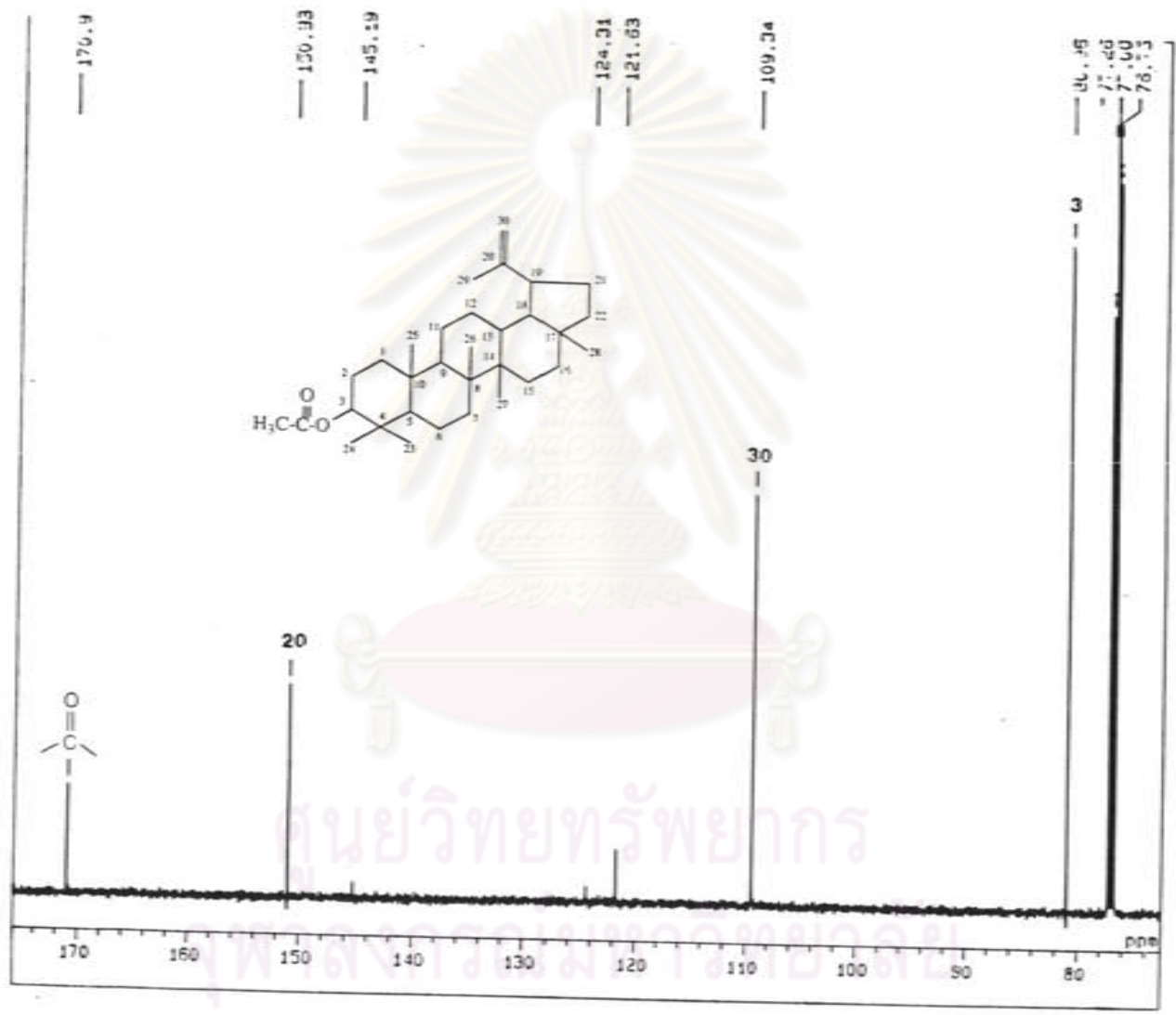


Figure 16 The 125 MHz ^{13}C NMR spectrum of AG-3 (in CDCl_3)

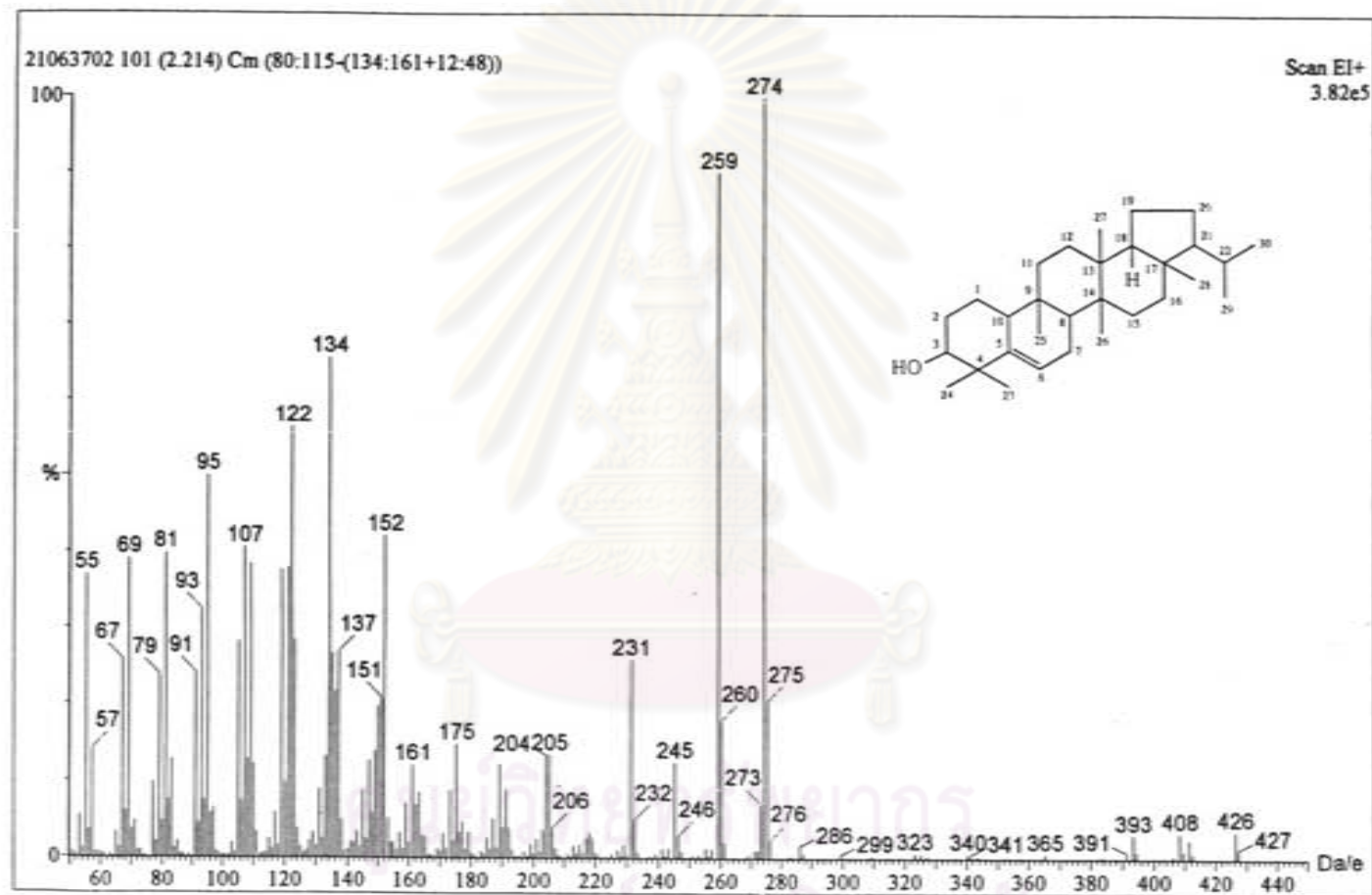


Figure 17 The EIMS spectrum of AG-4

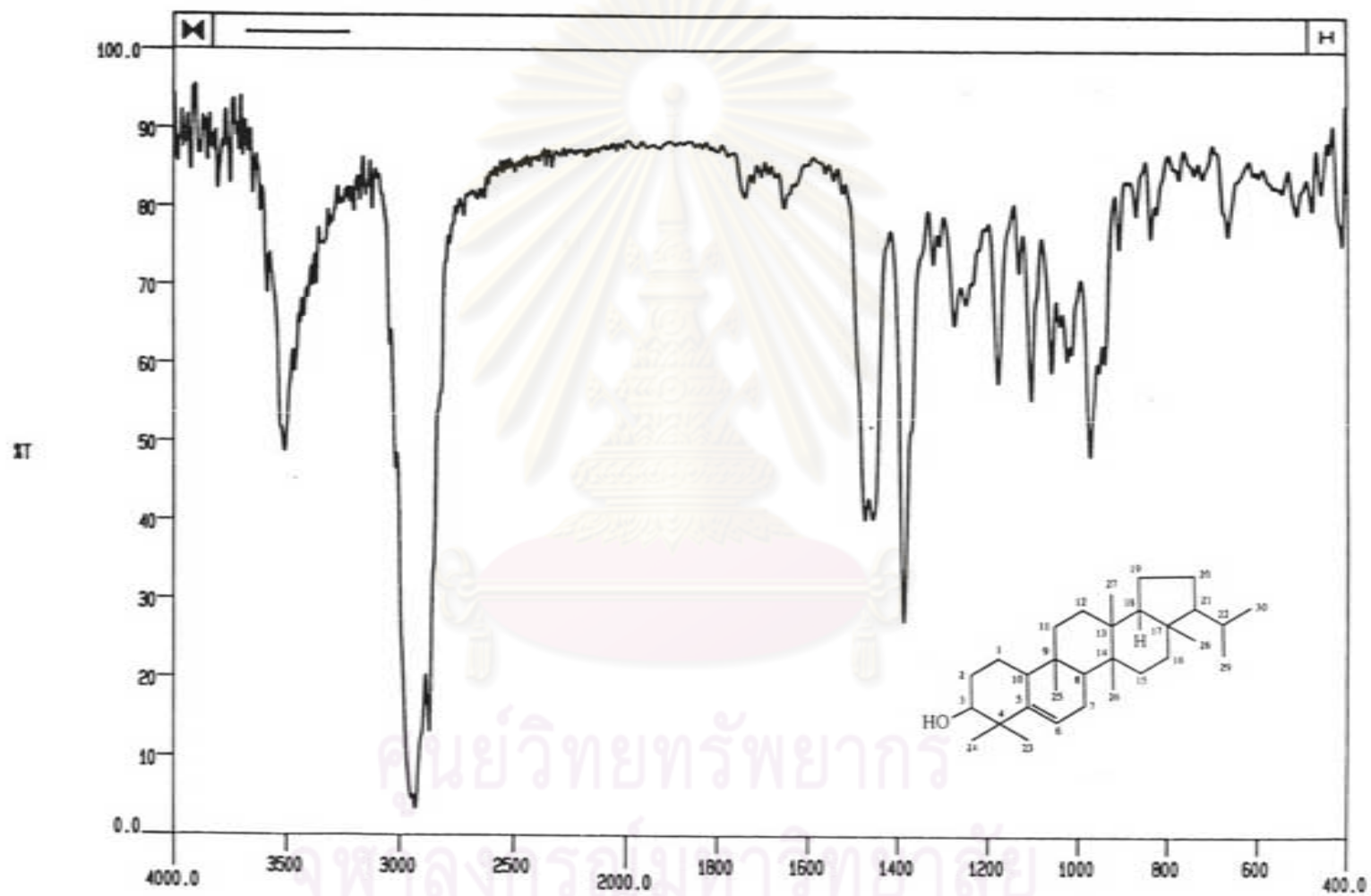


Figure 18 The IR spectrum of AG-4 (KBr disc)

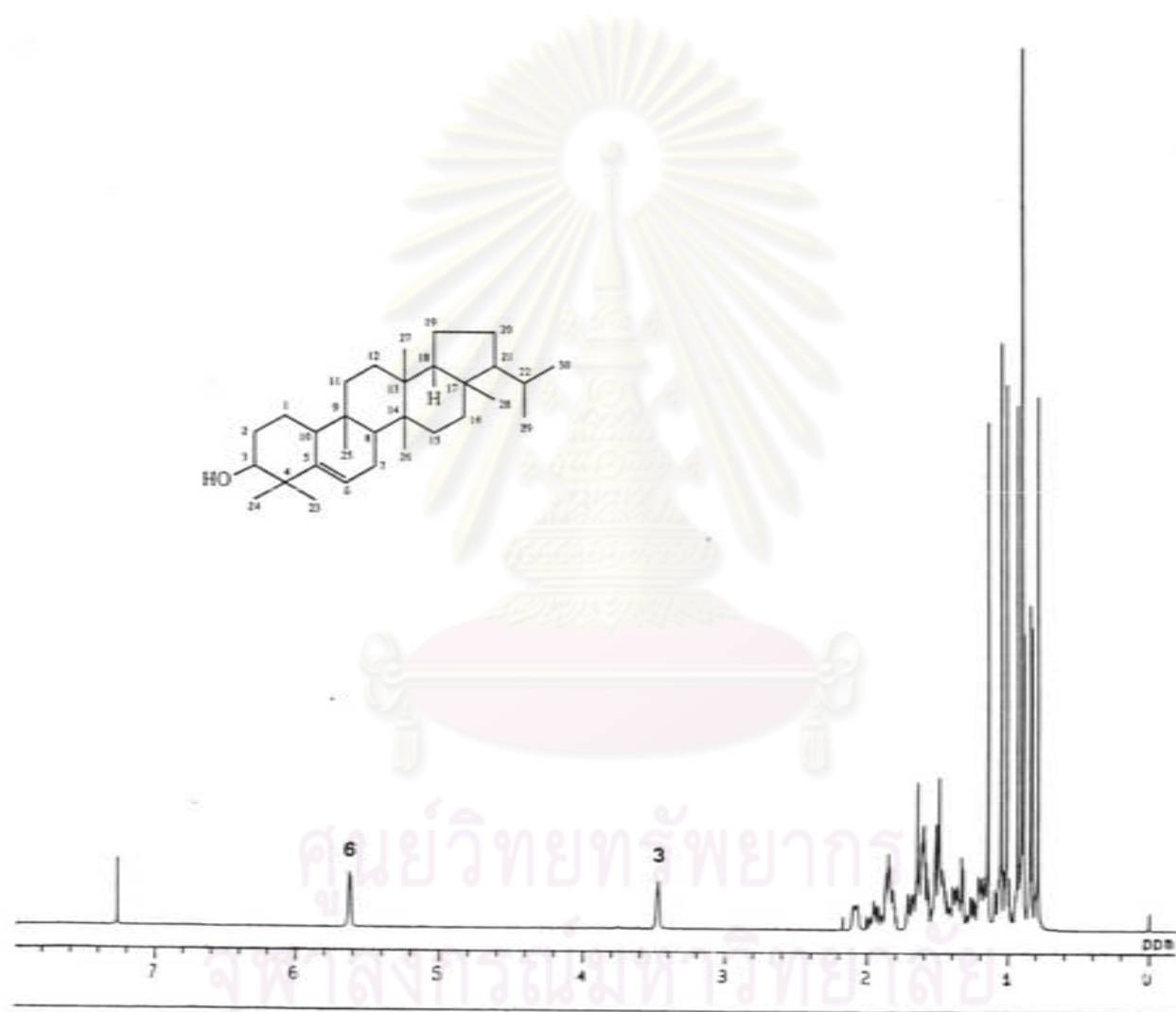


Figure 19 The 500 MHz ^1H NMR spectrum of AG-4 (in CDCl_3)

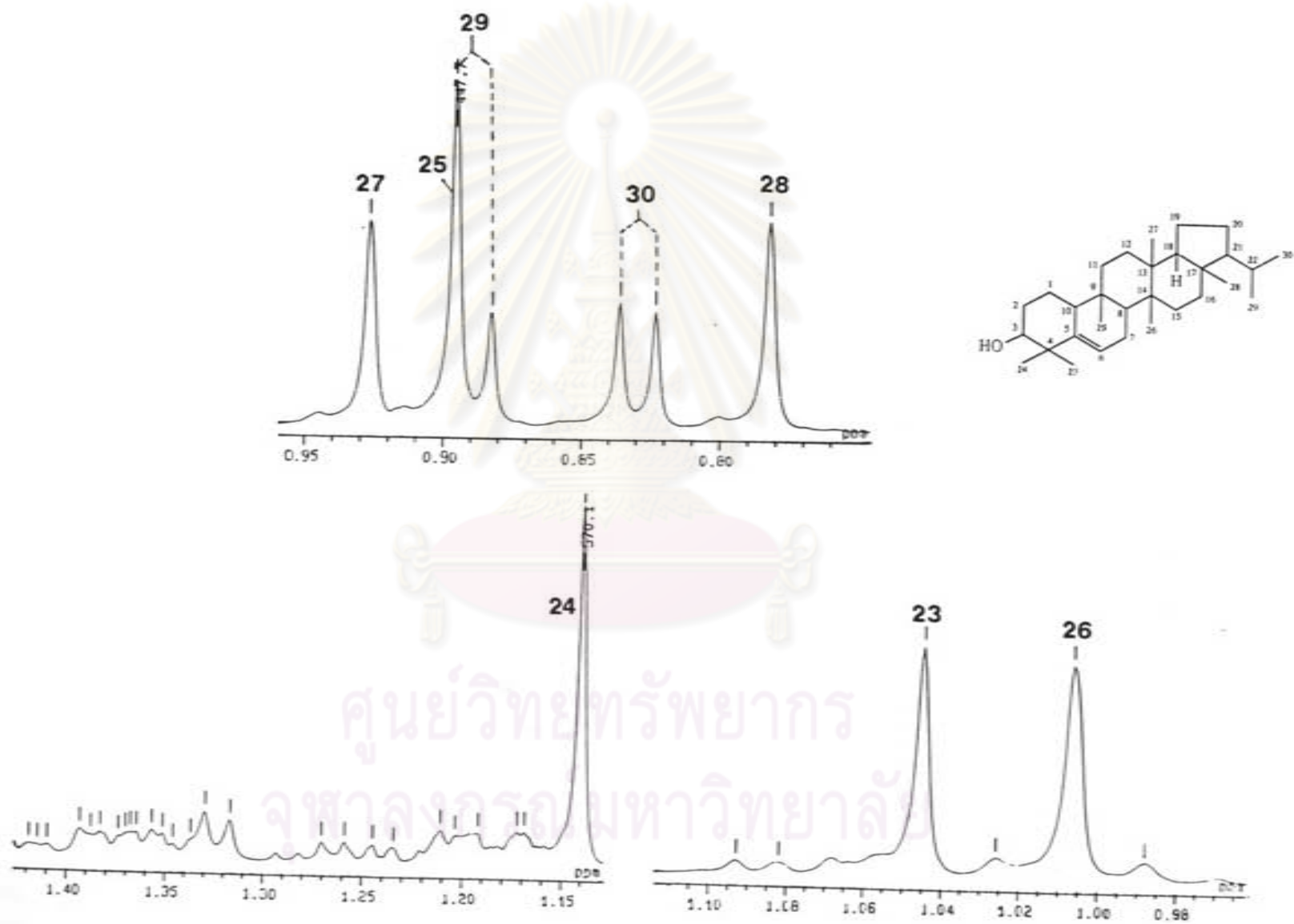


Figure 20 The expansion of 500 MHz ^1H NMR spectrum of AG-4 (in CDCl_3)

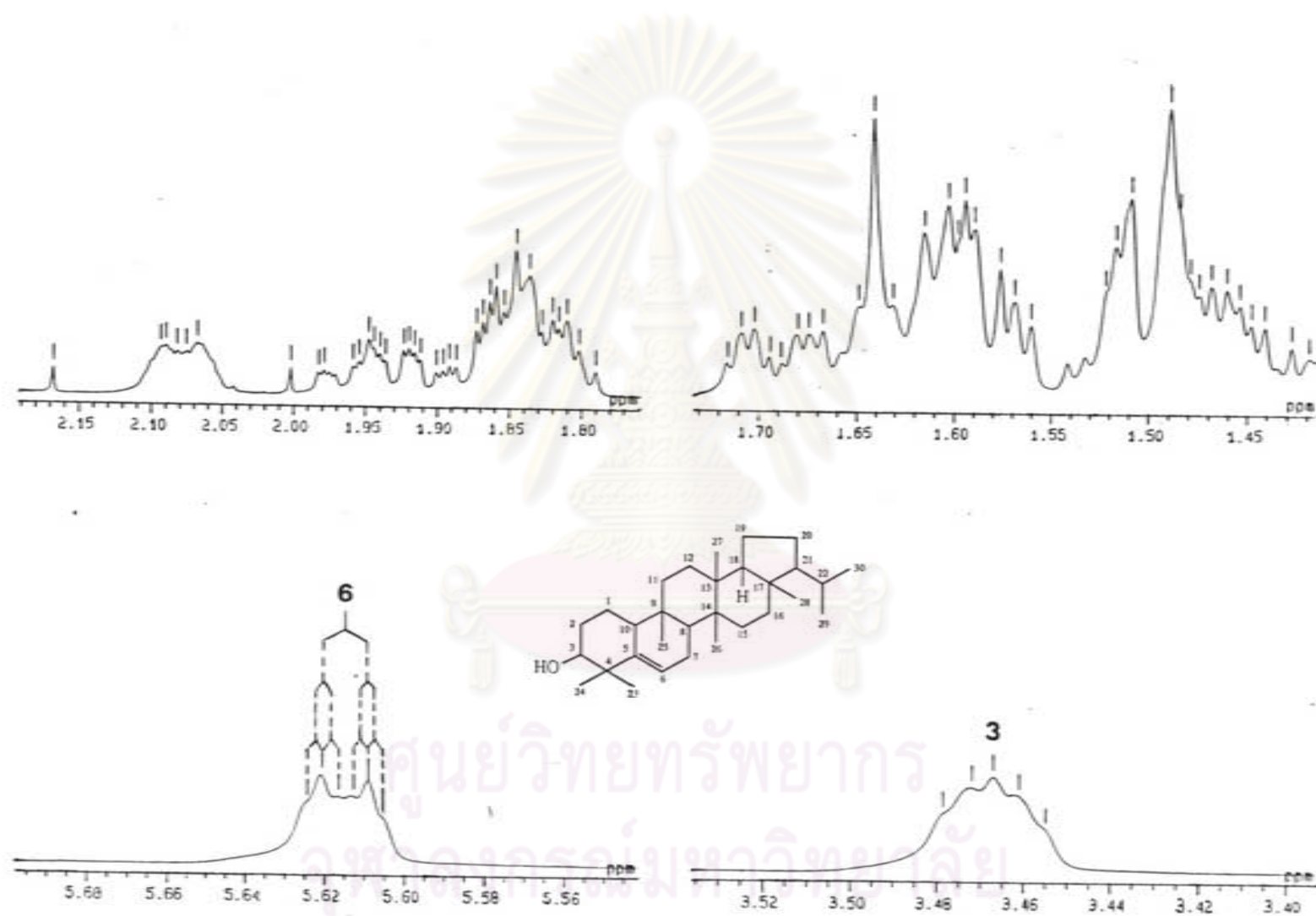


Figure 20 The expansion of 500 MHz ^1H NMR spectrum of AG-4 (in CDCl_3)

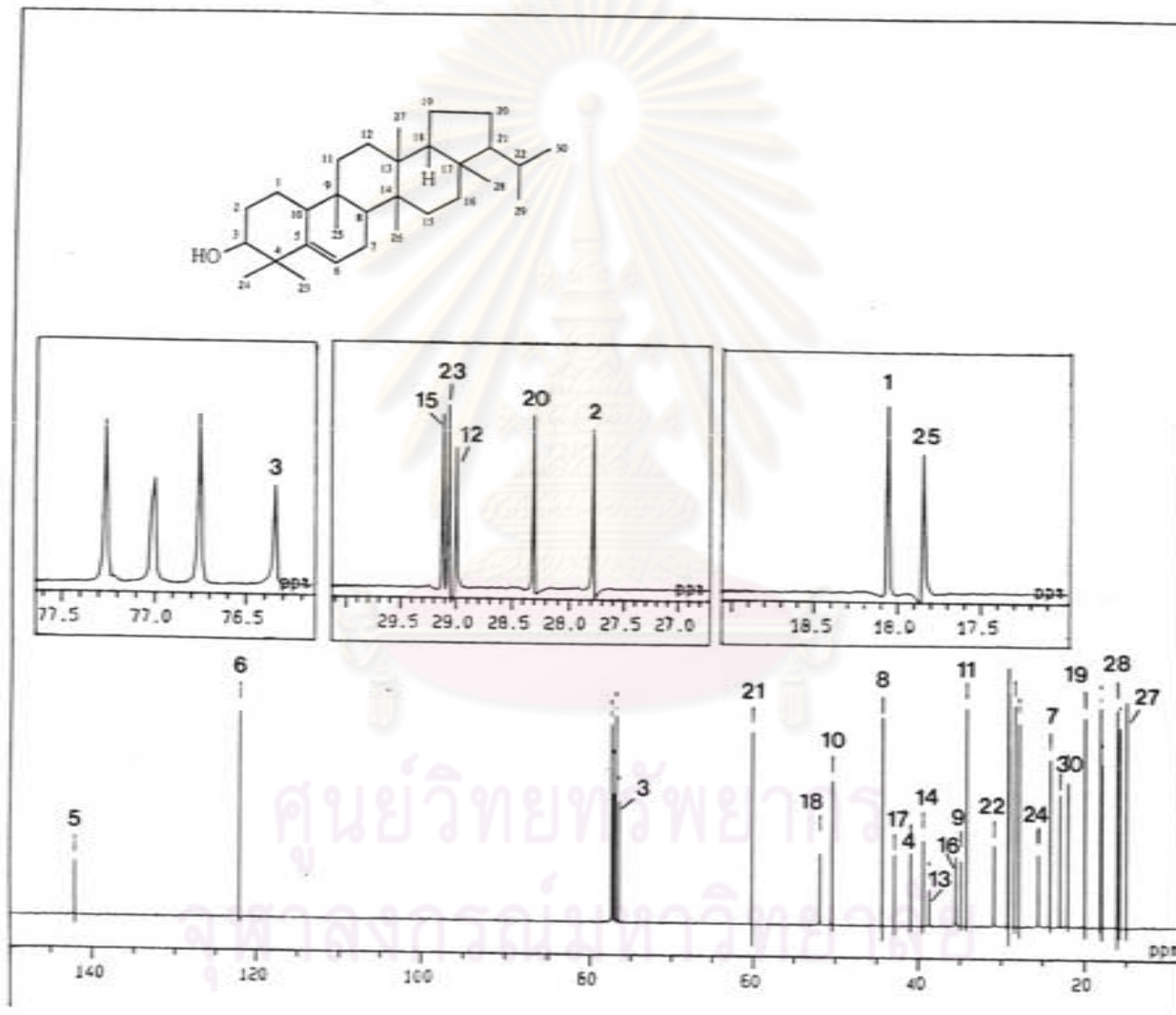


Figure 21 The 125 MHz ^{13}C NMR spectrum of AG-4 (in CDCl_3)

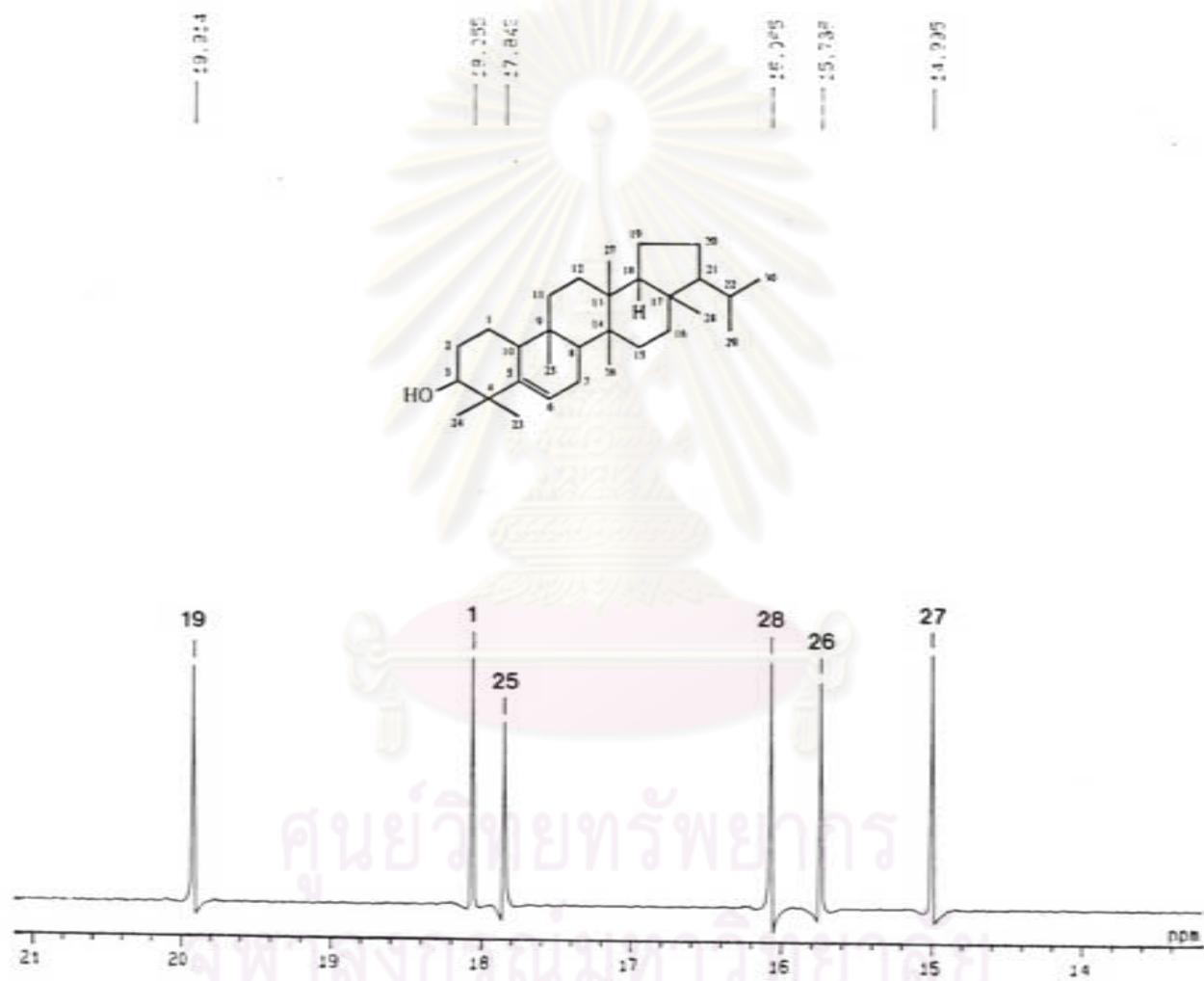


Figure 22 The expansion of 125 MHz ^{13}C NMR spectrum of AG-4 (in CDCl_3)

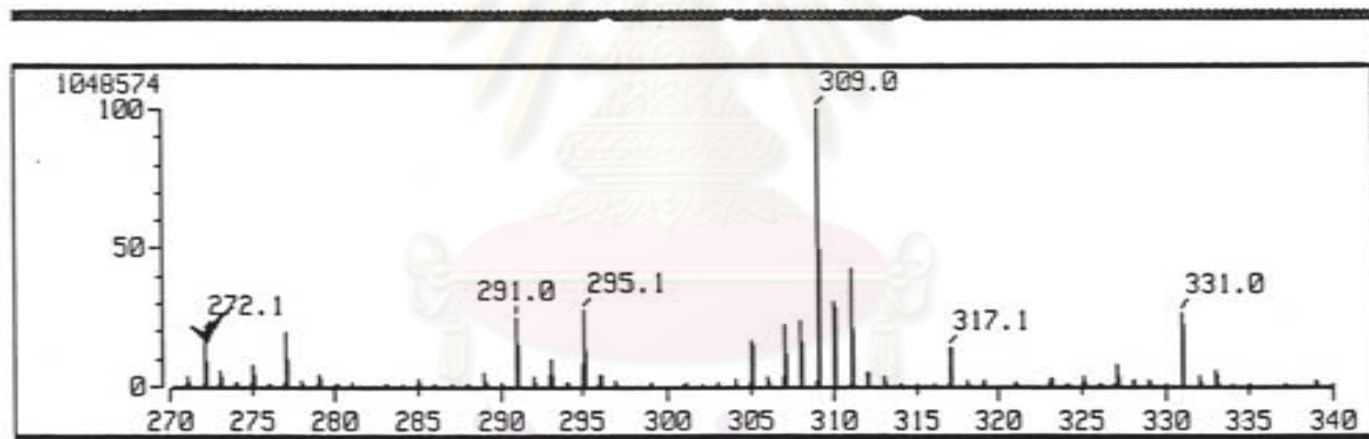
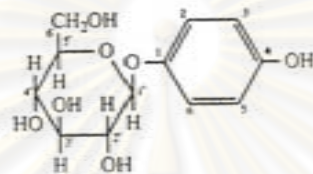


Figure 23 The HR-FAB-MS spectrum of AG-5 (Dithiodiethanol + NaCl)

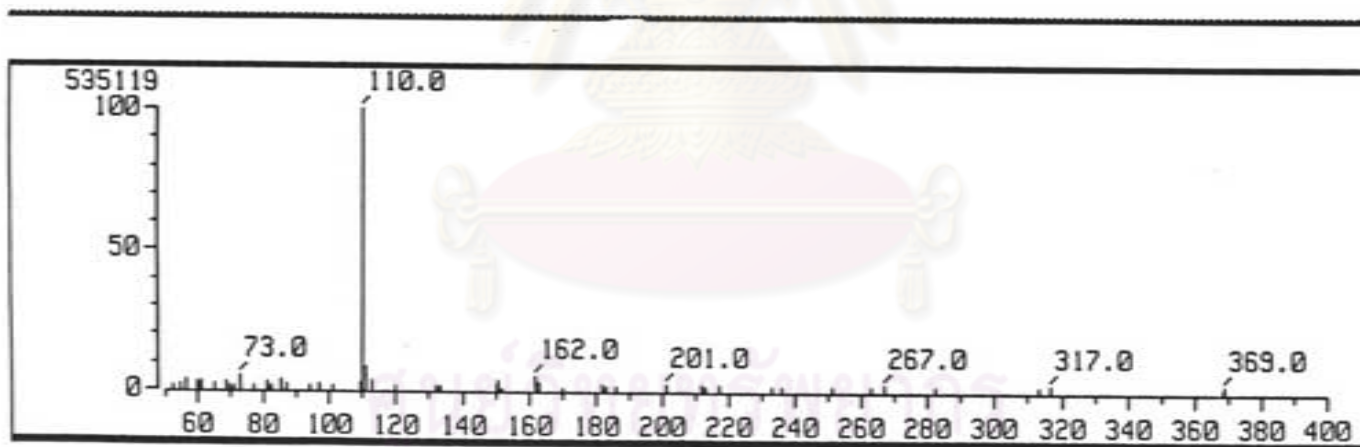
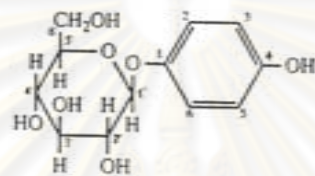


Figure 24 The EIMS spectrum of AG-5

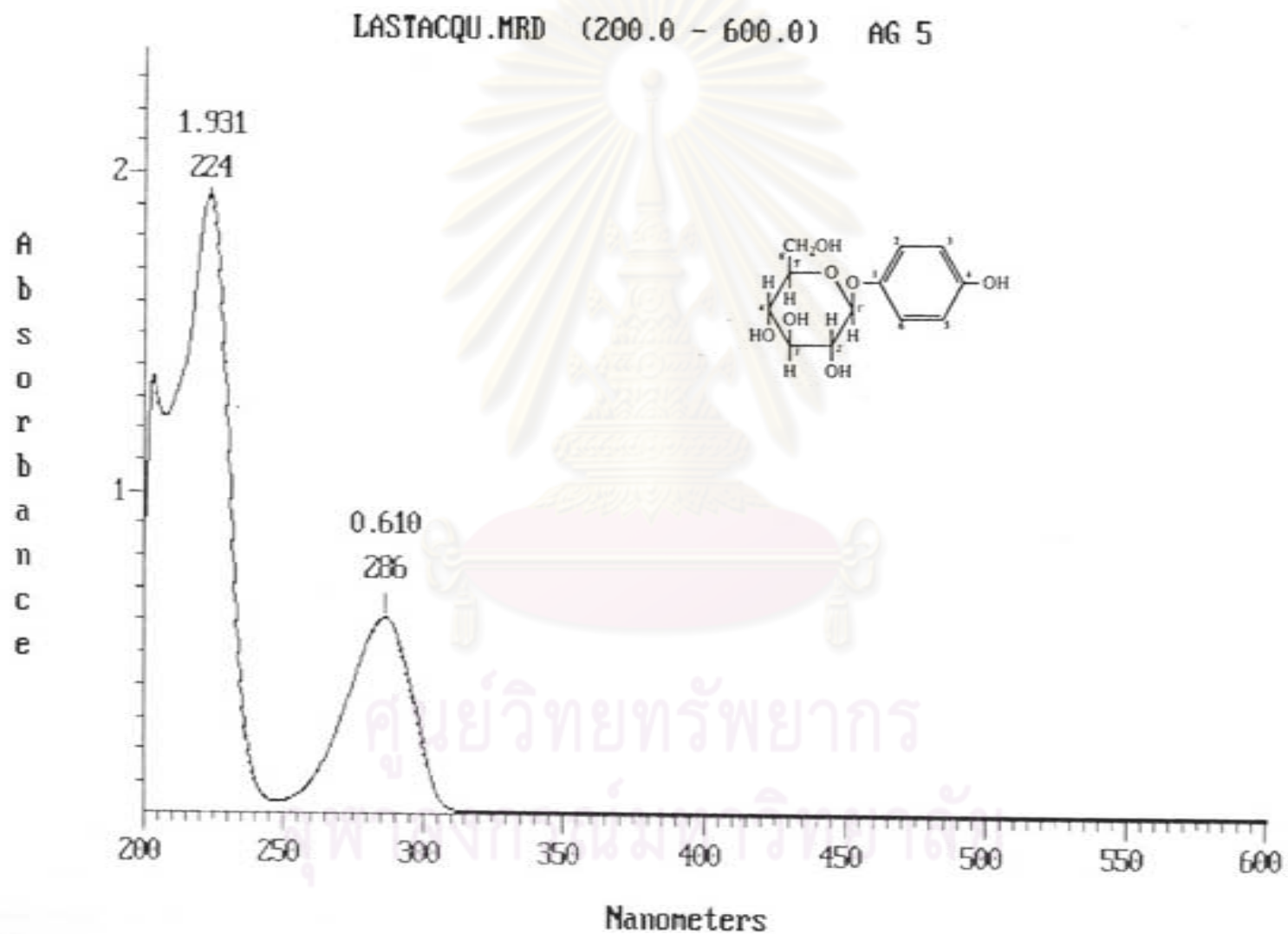


Figure 25 The UV spectrum of AG-5 (in methanol)

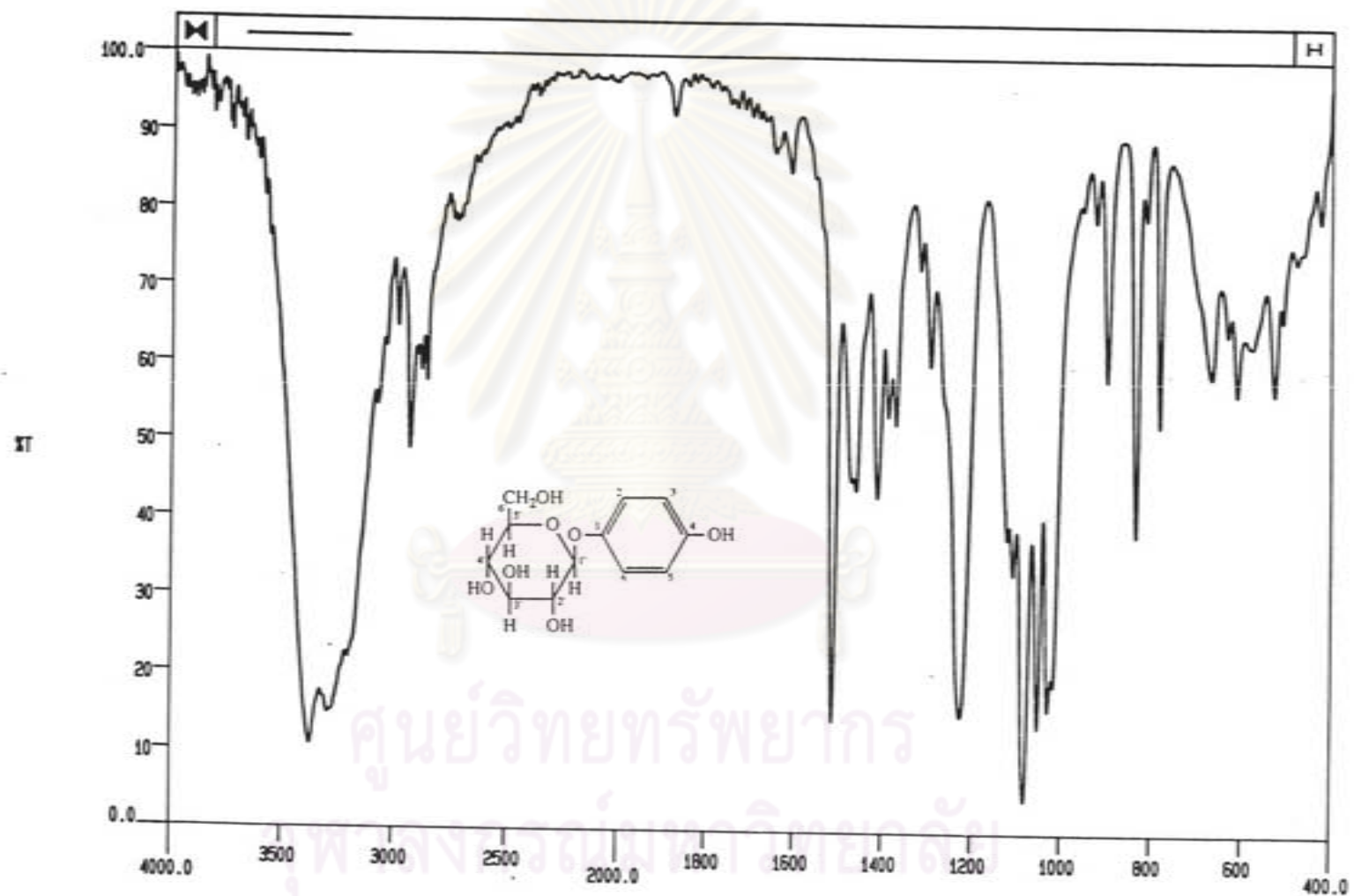


Figure 26 The IR spectrum of AG-5 (KBr disc)

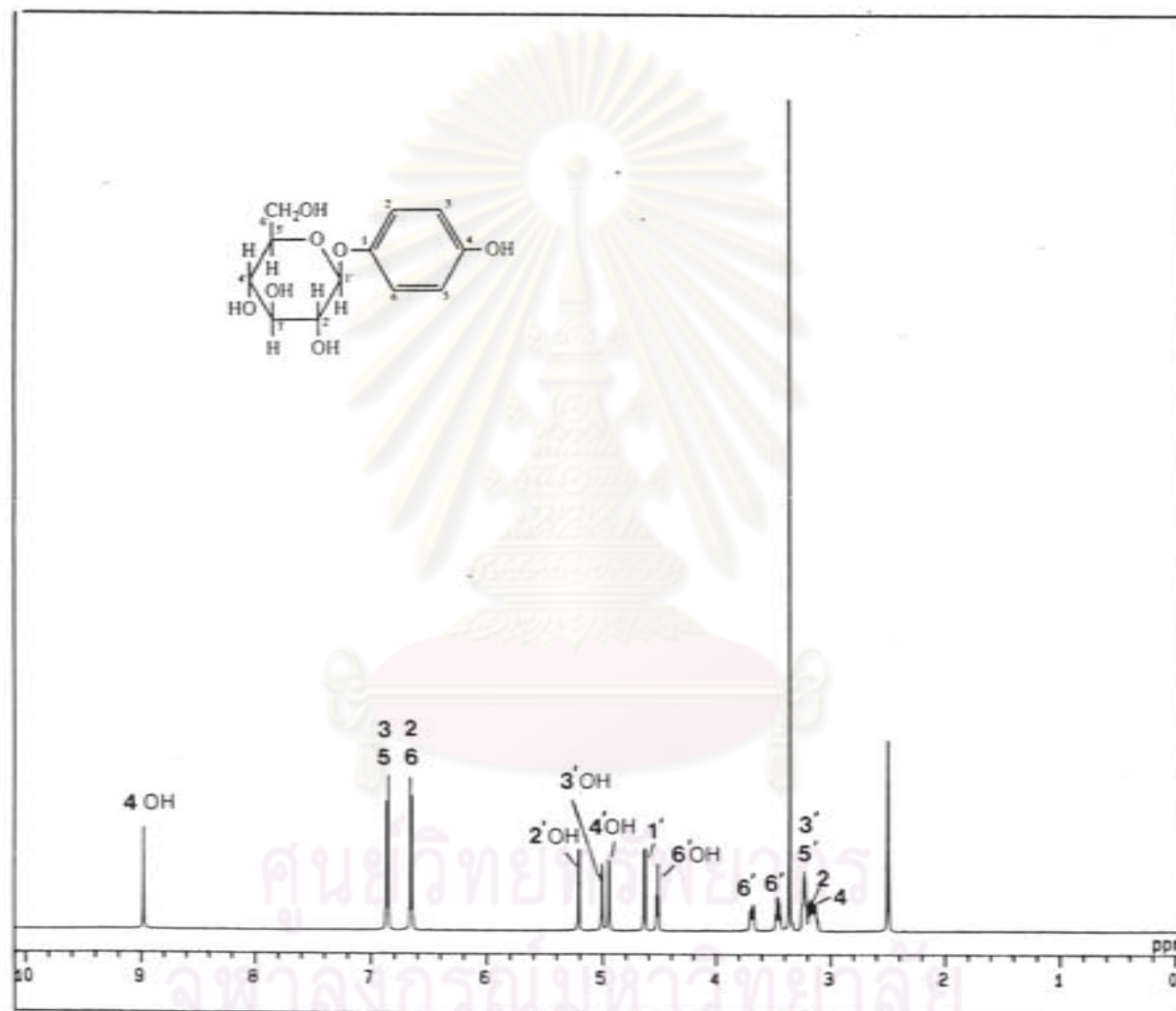


Figure 27 The 500 MHz ^1H NMR spectrum of AG-5 (in DMSO-d_6)

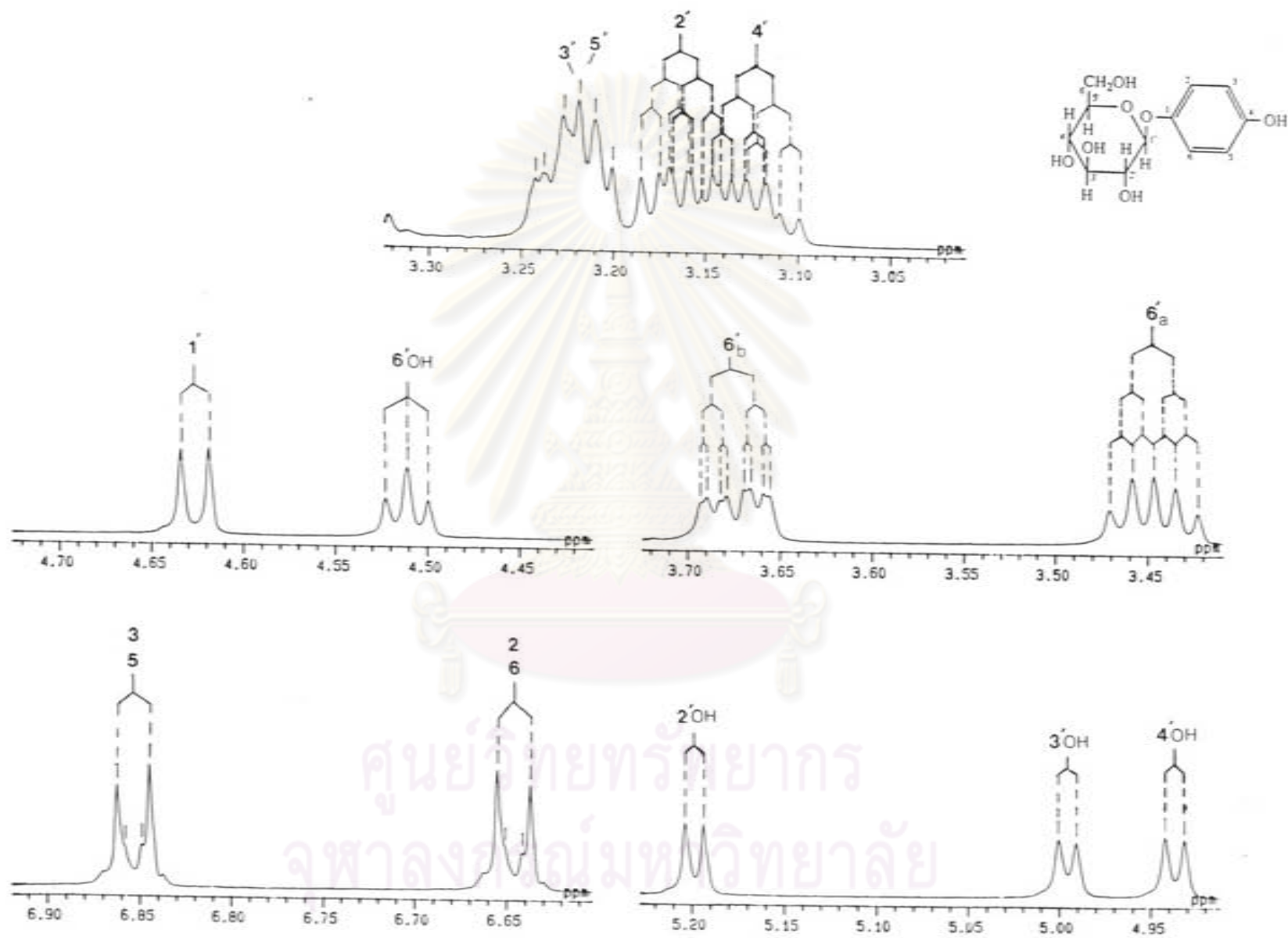


Figure 28 The expansion of 500 MHz ^1H NMR spectrum of AG-5 (in DMSO-d_6)

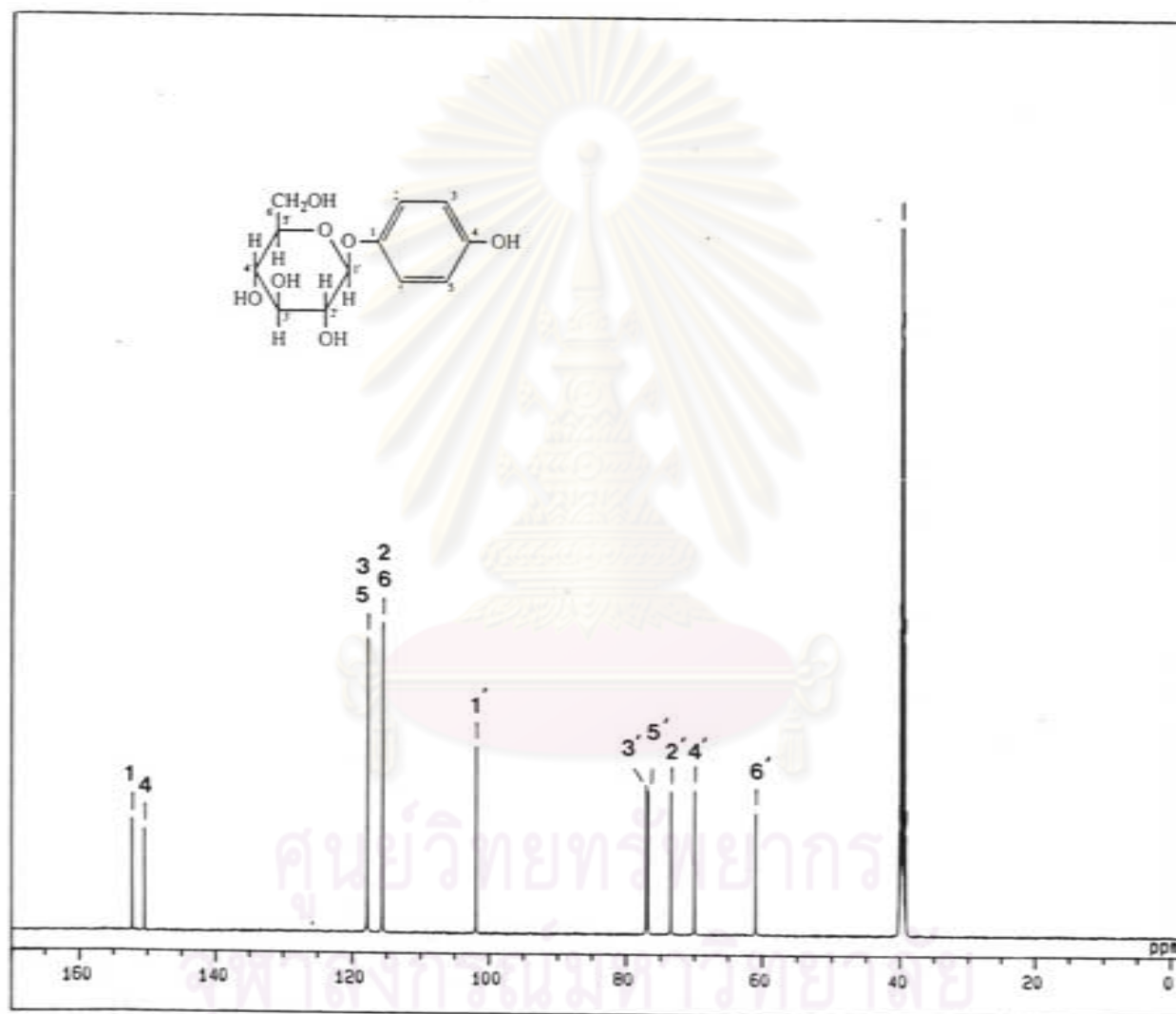


Figure 29 The 125 MHz ¹³C NMR spectrum of AG-5 (in DMSO-d₆)

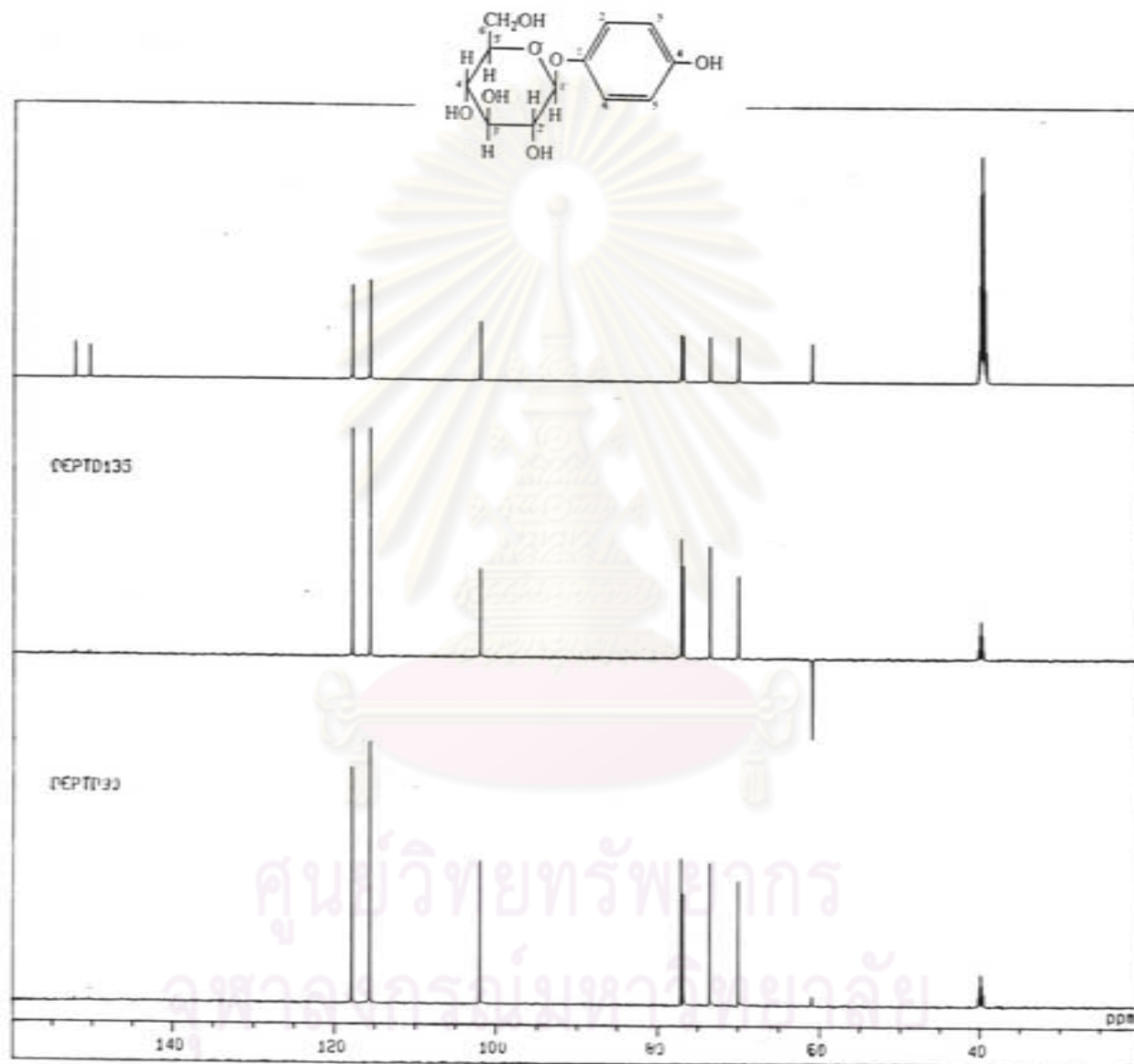


Figure 30 The 125 MHz DEPT spectrum of AG-5 (in DMSO-d₆)



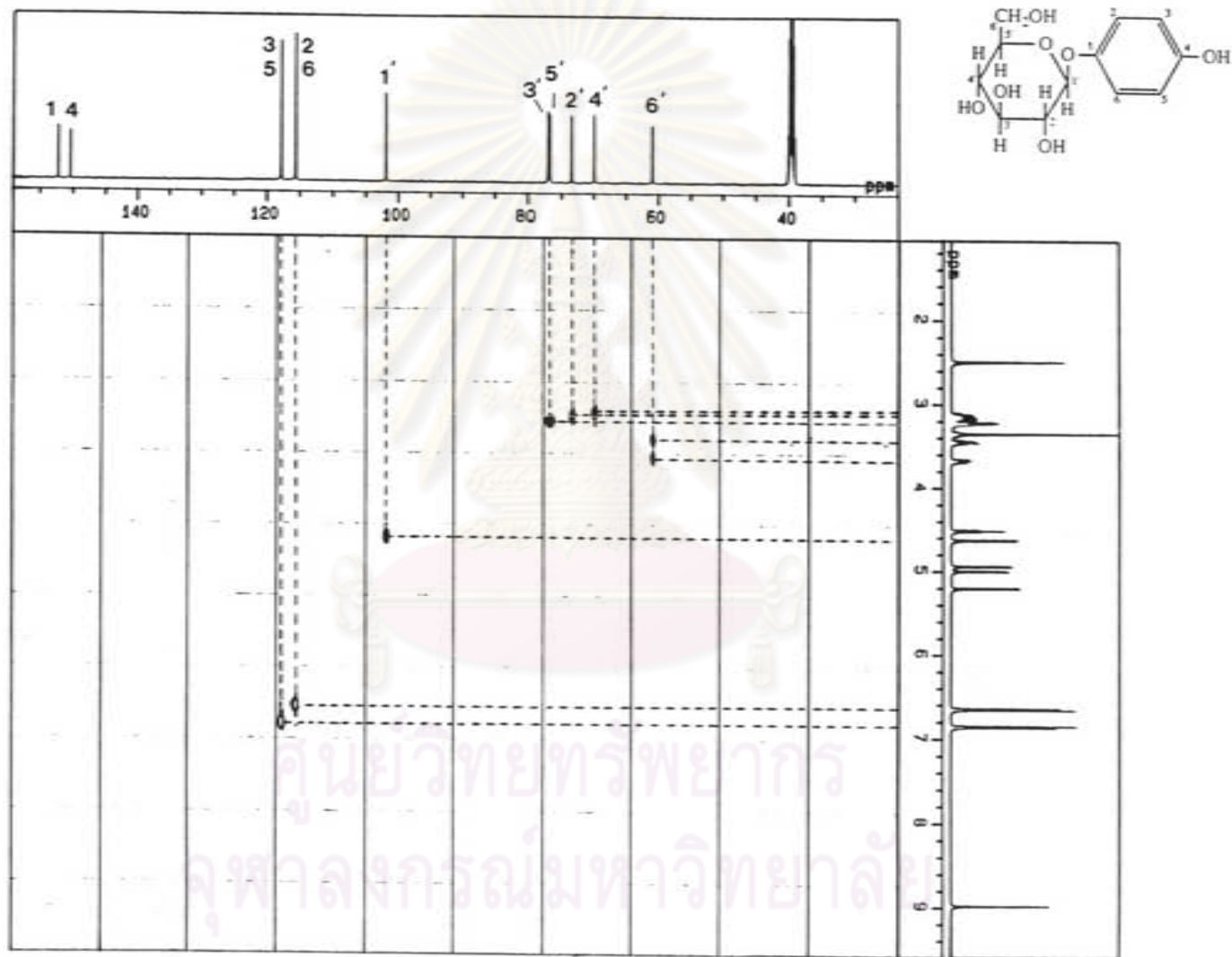


Figure 31 The 125 MHz ^{13}C ^1H COSY spectrum of AG-5 (in DMSO- d_6)

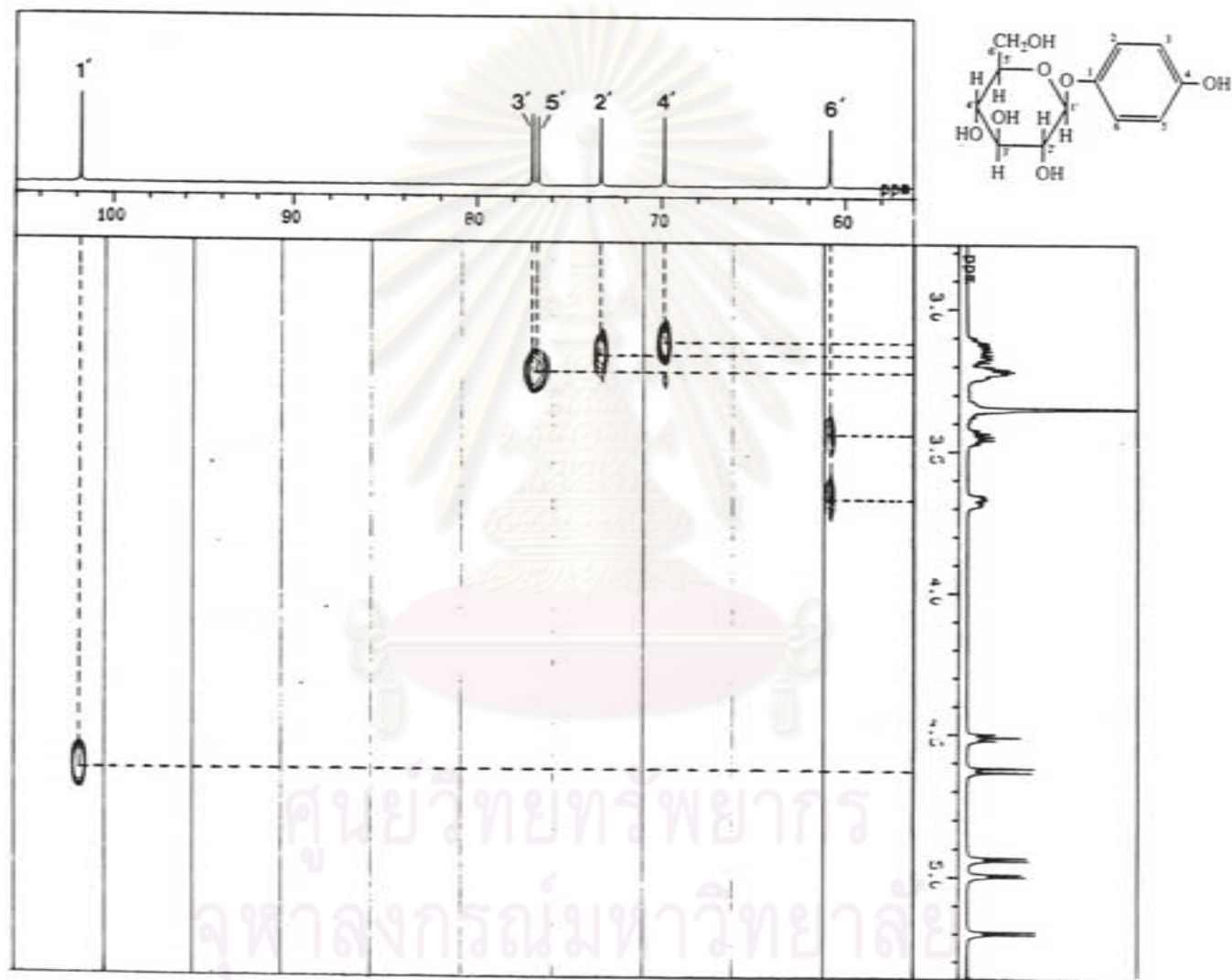


Figure 32 The expansion of 125 MHz ^{13}C ^1H COSY spectrum of AG-5 (in DMSO- d_6)

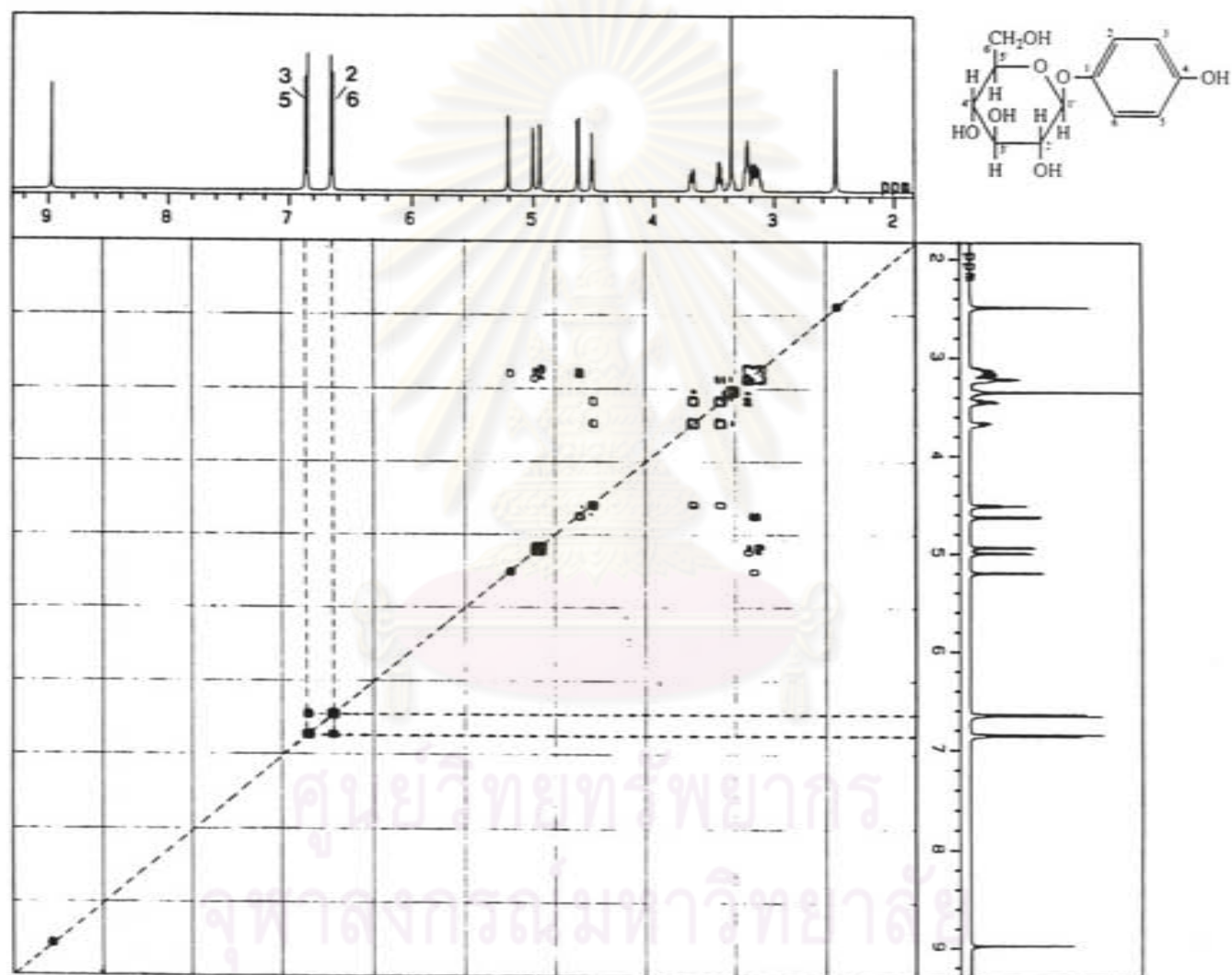


Figure 33 The 500 MHz ^1H ^1H COSY spectrum of AG-5 (in DMSO-d_6)

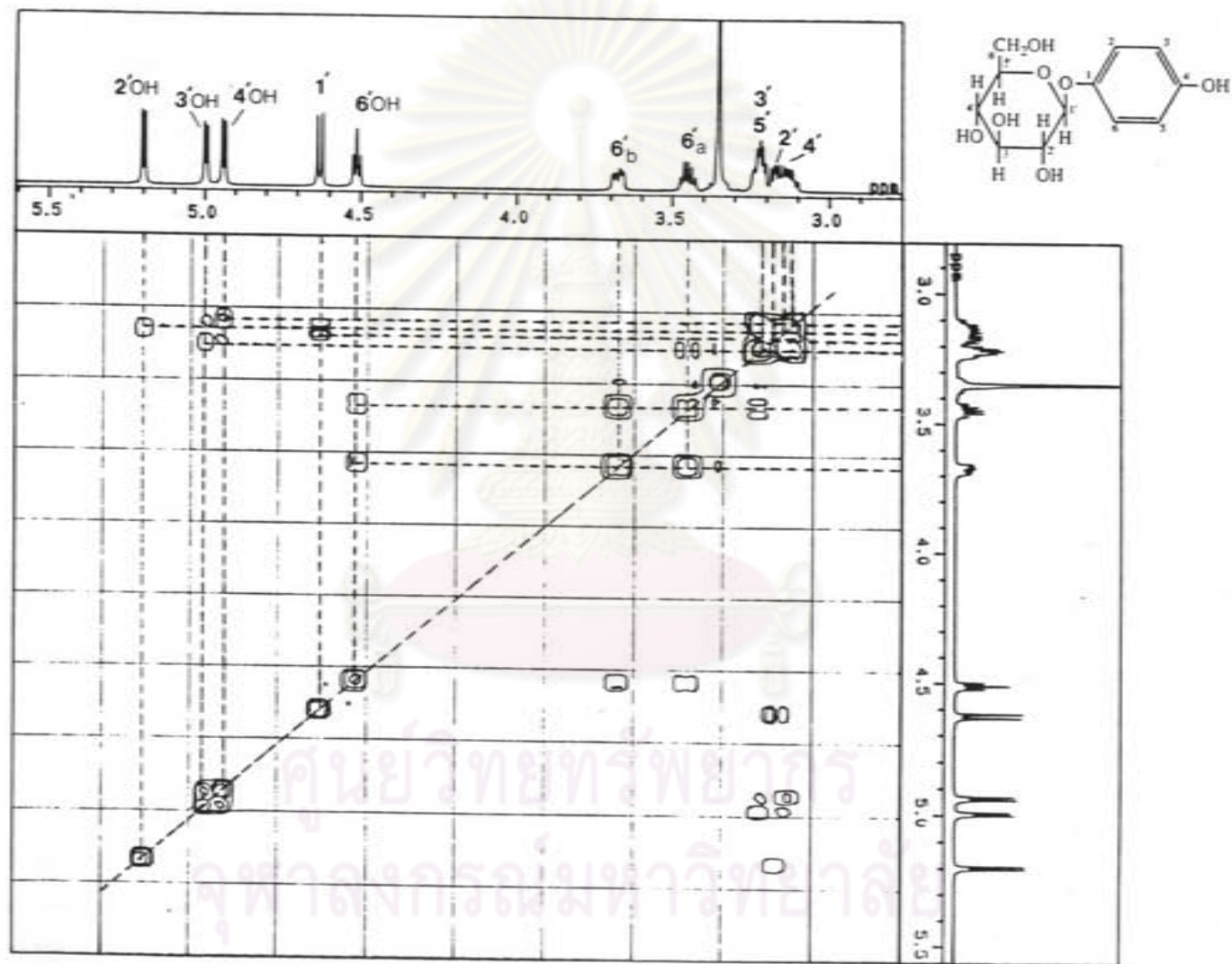


Figure 34 The expansion of 500 MHz ^1H ^1H COSY spectrum of AG-5 (in DMSO-d_6)



VITA

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